THE IRON TRADE REVIEW

VOLUME XXXV. CLEVELAND, O., MARCH 20, 1902. NUMBER 12

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The heavy buying of bars which has been the feature of the iron market in the past 10 days has been accompanied by a quieting down, though not a clearing, of the pig iron situation. Contracting by agricultural implement concerns for their supplies for the year beginning July 1 was stimulated by the announcement that the 1.50c price on steel bars would be held open to April 1, when the 1.60c basis on all quantities would become effective. It is safe to say that 150,000 to 200,000 tons of bars have been taken since the present buying movement began, and that negotiations pending point to a total approaching 300,000 tons by April 1. The great bulk of the business done has been in steel, but bolt and nut works, car works and jobbers have made large contracts in bar iron also. Confidence in the agricultural situation is shown in the action of the implement manufacturers, and the covering of their wants for a period ending 15 months ahead is the first pronounced index to the lapping of the prosperity of 1902 into 1903. Turning to foundry iron, which is still the object of more attention than any other factor in the market, the week has had no definite development. Since the February stampede, in which one large Southern interest sold 200,000 tons, there has been a steady subsidence of the market. The contagious desire to buy so noticeable then is largely gone. Leading sellers, whose salesmen were called in, say that this was not with the intention of withdrawing from the market, but under the belief that buyers would quiet down and postpone purchases for the last half until later in the season if they were not solicited to buy. The Southern concerns that have not advanced their price above $12 Birmingham are not now seeking to sell iron, but it appears that they are still doing some business for the second half, while not booking large tonnages. At the same time there is considerable business pending on which sellers do not appear ready to name their price. In other cases where the $12 price has not been regarded further sales have been at $13 Birmingham. One estimate of the possibilities of Southern production this year, including in the active list six or seven furnaces that have been repaired and will start in the next few weeks, figures that there will be made in the South in 1902 450,000 tons of iron that is not yet sold, or about half as much as had been sold for this year by eight Southern furnace companies up to March 1. Such an estimate of course contemplates the uninterrupted operation of all furnaces now active, and the curing of the transportation troubles that have prevailed since Dec. 1. The question of moment to both buyer and seller is the basis on which the unsold Southern product will be marketed. There are at the moment two classes among buyers—those who have no uneasiness about getting needed iron as the railroad situation improves and who want a few more things settled about 1902 before taking on all their needed iron for the year, and on the other hand those who feel that the price will not decline and that they prefer to make sure of their usual brands. One fact is to be considered, and that is that a large number of buyers ordinarily dependent on Southern irons for a good part of their supply have already bought for the balance of the year. In Bessemer and basic irons little business has been done. Buying by the steel companies for fourth quarter has not yet been taken up in earnest. The steel situation remains shut up. The independent sheet mills find that prices of German sheet bars have advanced $2 beyond the limit they had set for foreign purchases, and that $33 Pittsburg is the best basis now attainable. It is reported that the order will not be placed abroad, but that plans for securing a domestic supply may be worked out shortly. The structural demand is the most prominent factor in finished material, next to the activity in bars. In the Pittsburg district 20,000 tons was bought for local work last week. Eastern mills are getting from $5 to $7 a ton above the agreed basis of 1.60c Pittsburg. The statement that United States Steel Corporation companies have 6,000,000 tons of sold material on their books for 1902 is tangible evidence of the prosperity of the iron trade. Concerning the importation of English iron it is said that in addition to the 3,000 tons recently bought at Middlesbrough for this country three lots of 5,000 tons each were taken for the United States before the recent advances, but prices now are rather against this trade.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, March 19.

In both raw and finished material the iron and steel market continues to show phenomenal strength, with the heavy buying limited to the finished end almost altogether. This is largely due to the fact that consumers of pig iron are for the most part covered, while the consumers of billets and sheet bars are practically unable to secure any tonnage, although they would gladly close for thousands of tons for delivery the remainder of the year if the steel were now offered. On the other hand there has been heavy buying of steel bars and structural material during the past week, both lines showing great activity.

The activity in steel bars is due to the fact that the steel bar manufacturers have left open the price of 1.50c to all the large consumers until April 1, when the price will be advanced by all to 1.60c. Naturally, the agricultural implement manufacturers are availing themselves of this opportunity to close, not only for the six months ending October 1, but for the entire year ending with April 1, 1903. Contracts for fully 150,000 tons have been closed up to date and by April 1 it is firmly expected that the total tonnage closed will amount to 300,000 tons. Several of the large steel bar interests are asking 1.60c on less than 500 ton lots, while the Cambria Steel Co. is making a straight price of 1.60c, Johnstown, on all orders. The buying of iron bars is also fairly heavy and the Eastern bar iron manufacturers have unofficially advanced their prices $2 per ton above those of the Western manufacturers.

In structural material the Carnegie Steel Co., Jones & Laughlins, Ltd., and the Cambria Steel Co., are practically out of the market until the end of the year. Never in the history of the trade have the structural mills been thus sold fully ten months ahead, and this too with the building season just opening. The Phoenix and Passaic mills in the East are securing from $5 to $7 per ton over the agreed quotations on their product. This is readily done, for the reason that they can make fairly good deliveries. The Wabash railroad has placed an additional contract for viaducts with the American Bridge Co., calling for fully 15,000 tons of material, while 4,000 tons of material will be required in the erection of the new foundry of the Westinghouse Machine Co.

Reports received from Commissioner Bonnell, sent abroad by the independent sheet manufacturers to purchase 40,000 tons of sheet bars at a maximum of $31 per ton, delivered Pittsburg, indicate that he is unable to fulfil his mission, and the high prices now asked for foreign sheet bars will have to be paid if they are to be used. However, there is a movement on foot at present which if consummated will secure to the independent sheet mills shortly a certain supply of domestic steel, deliveries on which can be commenced within less than two months.

The agreement on the sheet scale, closed with the Amalgamated Association by the American Sheet Steel Co., practically insures the present scale for another year and the continuous operation of the mills through the summer months, as scale conferences will not interfere.

PIG IRON.—While high prices continue to be reported on all grades of pig iron, no considerable tonnages are being closed at the ruling quotations for prompt deliveries and there is a feeling in the trade that there will be enough iron to go around, despite the heavy contracting since the first of the year. Small lots of Bessemer iron for prompt shipment have been sold during the week at $17.25 to $17.50 at the furnace. Sales running into the fourth quarter are reported as having been made at $17 at the furnace. The sales of No. 2 foundry have been limited almost wholly to small lots for prompt shipment and on these $18 to $19 has been paid at the furnace in the Valley.

For fourth quarter delivery, however, a number of furnaces are willing to close contracts at $16.75 to $17 at the furnace. We note the sale of 500 tons of forge iron for delivery to July 1 at $17.75, Pittsburg. Small lots of basic iron are offered at $17.50 to $17.75, Pittsburg. We revise quotations as follows:

Bessemer, Valley	$16 75 to 17 50
Bessemer, Pittsburg	17 50 to 18 25
No. 1 Foundry	18 00 to 19 25
No. 2 Foundry	17 25 to 18 50
No. 3 Foundry	16 50 to 17 50
Gray Forge, Pittsburg	17 25 to 17 75
Chilled Basic, Valley	16 50 to 17 00
Chilled Basic, Pittsburg	17 25 to 17 75

STEEL.—Commissioner Bonnell's mission to Europe to purchase sheet bars for the independent sheet manufacturers is practically without result, as he is unable to secure the bars at the price contemplated. German sheet bars cannot be delivered in Pittsburg for less than $33 per ton at the present time, while some importing interests are asking as high as $33.50. On 4x4 billets $31.75 to $32.25 is asked. Domestic billets for the second half delivery are being offered at $32, Pittsburg, but not by the largest interests, who have advised some of their customers, whose contracts expire on July 1, that there is considerable doubt about the renewal of these, for the present at least. On the other hand there are indications that the requirements of the independent sheet manufacturers will be largely supplied by domestic steel and if the deal now under way is consummated the independent sheet mills now suffering for lack of steel will be supplied within less than two months. The rod market continues strong at $36.

FERRO-MANGANESE.—There has been no change in the price of domestic manganese, 80 per cent, which is held at $52.50 per ton, delivered at buyer's mill. Foreign manganese is offered in small lots at $50 per ton the same delivery.

SPELTER.—The market continues fairly strong and prime Western grades are held at 4.15c to 4.20c, Pittsburg.

MUCK BAR.—On account of the advancing forge iron market the price of muck bar continues to advance. The largest producer is asking $32 per ton at mill, while the independent producers are all holding out for $33, and we note the sale of 500 tons at that price, deliveries being more satisfactory than could be promised elsewhere.

SKELP.—While the large interests are holding grooved and sheared iron skelp at 1.95c to 2c, independent producers are asking 2.05c to 2.10c. Steel skelp is held at 1.85c to 1.95c and is steadily advancing on account of the high price of steel.

RAILS AND TRACK MATERIAL.—Light rails are commanding exceedingly high prices and are in big demand for prompt deliveries. We revise quotations as follows: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $45; 12 pounds, $42; 16 pounds, $39; 20 pounds, $37; 20 pounds, $35; 20 to 40 pounds, $33. Track material: Spikes, 2c to 2.05c; track bolts, square heads, 2.50c; hexagon heads, 2.65c; fish plates, 1.60c.

PLATES.—At the meeting of the plate manufacturers, held in New York last week, it was decided to make no change in quotations. The tonnage carried by the mills is now more satisfactory than it has been for some time, nearly all having from three weeks' to a month's work on their books. We make the following quotations: Tank plate, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

PIPES AND TUBES.—A large amount of new business in both merchant pipe and boiler tubing continues to be placed, not only with the largest producer, but with the independent mills. Discounts to jobbers in carload lots, Pittsburg, are revised as below:

MERCHANT PIPE.

	Blk. Per cent.	Galvd. Per cent.
⅛ to ¼ and 11 to 12 inches	60	48
⅜ to 12 inches	67	55

Discounts below are to consumers in carload lots, Pittsburg:

BOILER TUBES.

Steel.

	Per cent.
1 to 1¼ inches	47½
2¼ to 5 inches	65½
1¼ to 2¼ and 6 to 13 inches	60

Iron.

	Per cent.
1 to 1¼ and 2¼ inches	43½
1½ to 2¼ inches	43
2½ to 13 inches	53

CASING.

	S. and S. Per cent.
2 to 3 inches	58
3½ to 4 inches	63
4½ to 12½ inches	65

BARS.—In order to give the large consumers of steel bars an opportunity of placing their orders for the next six months and for a year, from July 1, the price of 1.50c on all orders for 500 tons or over will be held open until April 1, when the price will be advanced to 1.60c by all interests on all orders. On less than 500-ton lots we make the following quotations: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under three inches, 1.70c; over 3 inches, 1.80c. The Western iron bar manufacturers are holding their product at 1.70c, Pittsburg, with full freight added to point of delivery, while the Eastern mills have decided to ask $2 above this price. Hoops and bands are quoted at 1.90c, full extras; refined iron bars, 2c and upwards.

SHEETS.—While the independent interests have been securing prices slightly in advance of those of the American Sheet Steel Co. for some time, they are no longer in position to do so and at present the quotations of the combine and the independent mills are about the same. Quotations to consumers are as follows: Nos. 10 and 12, 2.40c to 2.50c; 14 and 15, 2.50c to 2.60c; 16, 2.60c; 18 and 20, 2.70c to 2.80c; 22 and 24, 2.80c to 2.90c; 26, 2.90c to 3c; 27, 3c to 3.10c; 28, 3.10c to 3.20c; 29, 3.25c to 3.35c; 30, 3.35c to 3.45c. Galvanized sheets are quoted at 70, 10 and 5 off in carload lots; less than carload lots, 70 and 10 off.

STRUCTURAL MATERIAL.—The three largest structural producers in the country have practically their entire output sold through the entire year and in a number of instances contracts lap over into 1903. The contract placed during the week by the Wabash Railroad calls for 15,000 tons of material, while other contracts bring the total tonnage of the week up to 20,000 tons. The Phoenix and Passaic mills in the East are now securing premiums ranging from $5 to $7 per ton, for the reason that they have a considerable tonnage for delivery throughout the entire year. Agreement quotations are unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

WIRE AND WIRE NAILS.—Some of the independent wire nail and wire interests are in favor of a slight advance in the price of their products and at a meeting to be held shortly a slight advance may be made. We quote: Wire nails in carload lots, $2.05 per keg; smaller lots, $2.10 and $2.15; plain wire, $2 in carload lots and $2.10 in less than carload lots to retailers; galvanized wire $2.40 in carload lots; polished staples $2.20 and galvanized staples $2.60; painted barb wire $2.60 and galvanized $2.90. These prices are quoted on a Pittsburg base, plus the actual freight to destination. Cut nails are held at $2 in carload lots and $2.05 in less than carload lots, Pittsburg, plus freight to destination.

MERCHANT STEEL.—The Maryland Sheet & Steel Co. of Cumberland, Md., will shortly enter into competition with the Crucible Steel Co., Cambria and Pennsylvania companies in

the production of harow discs. This is the only concern that will manufacture them outside of the three interests named. We quote: Turned, cold rolled and ground shafting in carload lots 50 off, and in less than carload lots, 45 off; tire steel, 1.70c in carload lots and 1.80c less than carload lots; toe calk, 2.10c to 2.25c; sleigh shoe, 2c to 2.25c; machinery steel, 1.50c; smooth machinery steel, 1:75c. Tool steel, 7 cents and upwards.

Old Material.—The heavy demand for material for open-hearth purposes has resulted in big advances on low phosphorus stock, heavy melting scrap and wrought scrap. The entire market has also advanced in sympathy with this material. We revise quotations, gross tons, as follows: Heavy wrought scrap, $21 to $21.25; cast scrap, $17 to $17.25; iron rails, $25 to $25.50; car wheels, $19; cast borings, $9.50; wrought turnings, $14.25; steel rails, $19.25; steel rails for re-rolling purposes, $24.

Coke.—The production of the Connellsville region continues to hover about 215,000 tons weekly. For second half delivery strictly Connellsville furnace coke is quoted at $2.50 per ton and foundry at $3 to $3.25; outside furnace coke, $2.25, and foundry, $2.75 to $3. For prompt delivery as high as $3 per ton is paid for furnace and $3.50 for foundry.

CHICAGO.

Office of *The Iron Trade Review*, 534 Monadnock Block, March 18.

The local situation has changed little since our last report. All manufacturers are working under an embarrassment of orders, and are compelled to use fine discrimination in the selection of that portion which they care to accept. Regular customers are the only ones whose wants are being cared for at the present time, and sellers naturally feel the obligation of looking after these interests. The scarcity of both raw and finished material grows more pronounced each week, and the difficulty of getting either for prompt shipment or future delivery the greater. Most of the mills and furnaces have contracted for nearly their entire output for this year, and what tonnage is still unsold, manufacturers are holding on to, feeling the necessity of having something to fall back upon in case of unforeseen accidents. A greater tonnage is turned down each week than is sold, which is particularly true of pig iron, notwithstanding the enticing premiums offered for prompt delivery. The prominent feature of the transactions in the past week was the heavy buying of bars and merchant steel by implement manufacturers for their needs for the year commencing July 1.

Pig Iron.—Sales in the past week have not been numerous, nor the aggregate of tonnage sold large. This is not due to any lack of orders, but to the inability of furnaces to supply the material in the times specified. Some are nearly sold up for the balance of the year; others are discouraging sales while the present condition of the market exists; and others, while they have the iron for sale, are experiencing so much difficulty in getting the material out of their yards, owing to the lack of cars, that they are accepting as little business as possible until these stocks have been decreased. There is an insistent demand for iron for prompt shipment, and consumers are willing to pay almost any price to get it. Offers of $2 a ton above regular prices are common, but except in the case of old customers, furnaces as a rule, are holding on to what iron they have still unsold. There are no regular quotations in this market, and prices vary in the different offices. The largest Southern sellers report they are still holding No. 2 Foundry at $12. Birmingham and other grades on the old basis, but as they are not offering iron, these concerns cannot be said to be a factor in this market at the present time. The price asked by furnaces still selling varies according to the relations which the consumers have held with the sellers in the past, but all the latter report they are selling old customers on the basis which prevailed before the scarcity began to be felt. The coke situation has not improved any, and only about one-quarter the supply needed is being received. We have revised some of our quotations, which follow:

Lake Sup. Charcoal	$20 00	to $21 00	Southern Coke No. 4	$15 65	to $15 90
Local Coke Fdy. No. 1	18 50	to 19 00	Southern No. 1 Soft	17 65	to 18 15
Local Coke Fdy. No. 2	18 00	to 18 50	Southern No. 2 Soft	17 15	to 17 65
Local Coke Fdy. No. 3	17 00	to 17 50	Southern Gray Forge	15 65	to 15 9-
LocalScotchFdy.No. 1	18 50	to 19 00	Southern Silveries	17 65	to 18 1-
LocalScotchFdy.No. 2	18 00	to 18 50	Jackson Co. Silveries	19 00	to 19 6
Southern Coke No. 1	17 65	to 18 15	OhioStrong Softeners	18 50	to 19 0-
Southern Coke No. 2	17 15	to 17 65	Alabama Car Wheel	20 50	to 21 0
Southern Coke No. 3	16 65	to 17 15	Malleable Bessemer	19 00	to 19 5

Bars.—Some months earlier than is their custom, the agricultural implement manufacturers have entered the market for their wants for the year commencing July 1, and in the past 10 days a large tonnage has been placed. Not all of them have covered for their needs, and several good-sized contracts are still pending. Both the local manufacturers of steel report they are practically sold up for the balance of the year. We quote iron 1.85c Chicago; steel, 1.75c Chicago; out of store 2.10c.

Sheets.—Both manufacturers and jobbers report new business of satisfactory volume, and also that shipments from Eastern mills have improved in the past week to a marked degree. Some of the independent mills which have been actively canvassing this market for orders are sold up for several months, and prices have taken on a firmer tone. We quote No. 27 black from store, 3.35c to 3.45c, and galvanized 70 per cent to 70 and 2½ per cent.

Structural Steel.—Outside of small stocks in the hands of jobbers, virtually no structural steel of any size or shape can be had in this market. One larger interest reports that in the present month it has been compelled to turn down orders amounting to 10,000 tons. Shipments from mills have improved a great deal in the past few days. We quote mill shipments, carload lots, as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 6x6 and under, 1.75c; over 6x6, 1.85c; plates, 1.75c; base, tees, 1.80c; zees, 1.75c; lots from store, angles, 2.50c, minimum; tees, 2.55c, minimum; beams and channels, 2.50c per pound, minimum.

Rails and Track Supplies.—Orders continue to be offered as freely as heretofore, but owing to the crowded condition of mills, new business is not of great proportions. We quote as follows: Standard rails, $28; light sections, $36 to $38, according to size; out of store, $40 to $44; splice bars, 1.80c to 1.90c; spikes, 2.15c; track bolts and hexagon nuts, 2.90c to 3.90c, out of store 3c to 3.10c; square nuts, base, 2.75c to 2.85c; out of store, 2.85c to 2.95c.

Billets.—Inquiries continue to be received at the local offices, but the mills, having no steel for sale, invarjably refuse to quote. We quote Bessemer billets, $31 to $33; open hearth, $33 to $35.

Merchant Steel.—Implement manufacturers have taken advantage of the advice given them by mills to place their contracts early or else suffer for want of material, and there has been active buying in the past week. This trade has come into the market earlier than its usual custom, but the exigencies of the situation were thought to demand prompt action. Most of the buying has been for delivery within the year commencing July 1. We quote mill shipments, Chicago delivery, as follows: Smooth finished tire steel, 1.95c to 2c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe, 1.65c to 1.80c, flat sizes; concave and convex, 2c; cutter shoe, 2.40c to 2.60c; machinery steel, 2.15c to 2.25c, base; plow steel 2.50c and upwards, according to quality; toe calk, 2.25c to 2.35c; out of stock, 2.40c to 2.60c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 per cent to 10 per cent higher; cold rolled shafting, carload lots, 50 per cent off, Chicago; less than carload lots, 45 per cent off, Chicago.

Plates.—The local interest reports that its order books are kept comfortably filled, and while no exceptionally heavy buying has occurred, it is perfectly satisfied with the volume of business that comes in. We quote as follows, Chicago delivery: Tank steel, base, ¼-inch, 1.75c to 1.85c; flange steel, 1.90c to 2c; marine steel, 1.95c to 2.10c; fire box steel, ordinary, 2c to 2.10c; special, 2.25c and upward. Jobbers are selling from store according to size as follows: Tank steel, 1.90c to 2c; flange steel, 2.10c to 2.25c; marine steel, 2.40c to 2.50c; firebox steel, ordinary, 2.40c to 2.50c; special, 2.50c and upward.

Cast Iron Pipe.—Some good sized orders have been booked, but many of the inquiries now in are expected to be withdrawn owing to the recent cold snap, and the prospect of colder weather for the remainder of the month. Prices are very firm, as follows: 4-inch water pipe, $29, carload lots, f. o. b. Chicago; 6-inch water pipe, $28; 8-inch and larger sizes, $27; gas pipe, $1 per ton higher than above prices.

Wire and Wire Nails.—There is no diminution in the extraordinarily heavy demand which has prevailed for several months, and practically all that is manufactured goes into immediate consumption. That there is little stock in the hands

of jobbers and dealers is evidenced by the urgent letters received by the local manufacturer asking for immediate shipment of goods. We quote as follows: Smooth wire, carload lots, $2.15; painted barb wire, $2.75; galvanized barb wire, in carload lots, $3.05; wire nails, carload lots, $2.20; staples, carload lots, $2.30; jobbers' prices to retailers, 10 cents higher than above for carload lots, and 20 cents for less than carloads.

MERCHANT PIPE.—Active buying of this material does not usually commence until after March, and while the tonnage that is being booked from day to day is of fair proportions, it is not large enough to cause comment, prices are firm, at the following quotations:

MERCHANT PIPE, RANDOM LENGTHS.

	Black Per cent.	Galv. Per cent.
⅛ to ⅜ in.	58½	46½
¼ to 12 in.	66	53½

BOILER TUBES.

	Steel Per cent.	Iron Per Cent.
1 to 1¼ in.	40	35
1¾ to 2¾ in.	47½	37½
2¾ to 5 in.	57½	47½
6 in. and larger	45	40

COKE.—The local receipts are still entirely inadequate for the needs of this section, and many concerns are still operating their plants only half the time. Probably not one-quarter of the amount needed is being received. The excuse of railroads now is that they are short of cars. We quote spot coke, $6.25 to $6.50.

OLD MATERIAL.—The scarcity of scrap of all kinds still prevails, and dealers experience no difficulty in making sales at the present high prices. While mills are opposing the tendency to still higher prices, the dealers have the situation so well in hand that the opposition of the former seems to have no effect. We quote as follows:

Old iron rails	$22 50 to $23 50	Relaying rails	27 00 to 28 00
Old steel rails, 5 ft. and up	23 00 to 23 50	Old wheels	$17 50 to $18 00
Old steel rails, mixed	16 00 to 17 00	Heavy melting steel	15 50 to 16 00
		Mixed country steel	11 00 to 11 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$18 50 to $19 00	Steel Axles	$18 50 to $19 00
No. 2 R. R. wrought	16 00 to 16 50	Cast borings	to 7 50
Dealers' forge	14 00 to 15 00	Wrought turnings	to 13 00
No. 1 busheling	13 00 to 14 00	Iron axle turnings	to 14 00
No. 1 R.R.& mach.cst.	13 50 to 14 00	Steel axle turnings	to 13 00
Railway malleable	13 00 to 14 00	Stove plates	to 11 00
Country malleable	12 00 to 12 50	Old iron splice bars	to 19 00
Iron axles	22 00 to 22 50		

CLEVELAND

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, March 19.

The feature of the week in iron ore has been the chartering of 1,200,000 tons of vessel capacity by the United States Steel Corporation's lake interests at 75 cents from the head of the lake. This is 5 cents less than the minimum the majority of vesselmen have been willing to accept and these latest deals have been made after 4,000,000 tons had been taken on the basis of 80 cents from the head of the lake, 70 cents from Marquette and 60 cents from Escanaba. An official statement is made that under certain conditions the steel corporation may not require more than 1,000,000 tons additional. With an early opening of navigation its own vessels will carry 10,000,000 tons, and the prospect is, in view of the restrictions on one consumption in the past four months that less ore will need to be brought down the coming season than was figured on when navigation closed in 1901.

PIG IRON.—The sold up condition of Northern makers of foundry iron for the first half and the cessation of offerings from several Southern sellers have given a quiet market in the past week. Many founders are not accustomed to buy in March as far ahead as the last quarter, and believe there will be iron for that delivery at substantially today's prices. Others influenced by the difficulty of getting iron for the second quarter are placing their orders for so much as they will need in the second half. We make no change in prices, which vary according to delivery and the policy of the seller. There are some buyers who want iron for March-June deliveries, some inquiries for higher numbers, particularly from pipe works, being up. It is only in special cases that iron is to be had for this delivery. Forge continues firm at $17 at Valley furnace, very little being available. The wants are for early delivery. No new transactions in basic are reported. Prices range from $16 to $17 at Valley furnace. For Bessemer recent quotations are $17 to $17.25 Valley, on lots for second and third quarters. There has been some inquiry for both Bessemer and basic for fourth quarters. The settlement of the molders' and coremakers' strikes insures steady operation of Cleveland foundries for the year. Valley furnacemen will have presented to them on April 1 the problem of three 8-hour turns in place of two 12-hour turns. It is not given out yet what rate per hour the men will ask for the shorter day. The arrangement will call for 50 per cent more men unless it is the intention of the present employes to work two out of three turns for a portion of each week. We quote the Cleveland market as follows:

Bessemer	$17 75 to $18 25	Scotch No. 1	$17 75 to $18 75
No. 1 Strong F'dry	17 75 to 18 75	Scotch No. 2	17 25 to 18 25
No. 2 Strong F'dry	17 25 to 18 25	Gray forge, Valley	16 50 to 17 00
No. 3 Foundry	17 00 to 17 50	LakeSuperior charc'l	20 50 to 21 50

FINISHED MATERIAL.—Sales of bars, both iron and steel, have been large through local offices in the past week. In one instance the month thus far has made a record for two weeks' sales. On large contracts 1.50c Pittsburg on Bessemer bars has been done, but for the most part 1.70c Pittsburg has been the basis on iron. Bolt and nut manufacturers, and implement works have been the chief buyers in this territory. The fact that on April 1 the 1.60c price will prevail on large contracts for steel bars, as it has ruled for several weeks on smaller business, has brought a good many buyers into the market and they have covered for months ahead. Bolt and nut manufacturers are meeting in New York this week and the question of an advance in prices, in view of higher raw material will be up. They have sold heavily to agricultural works in the past two weeks. The demand for plates is somewhat greater. Deliveries are still easy and there is no prospect of any such stringency as occurred three years ago. Structural material in second hands has been in good demand in the past week and jobbers and structural shops have advanced the minimum price of beams and channels out of stock to 2½c. The sheet mills are making better deliveries week by week and are evidently getting some stock for the spring demand that is just ahead. No change is made in quotations on mill shipments, which in ordinary lots for consumers are as follows for Cleveland deliveries: No. 24, 2.90c to 3c; No. 26, 3c to 3.10c; No. 27, 3.10c to 3.20c, with extras for less than carload lots, etc. Store quotations range as follows, quantity and delivery determining the exact price: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.55c to 2.70c; No. 16, 2.95c to 3.10c; No. 18, 3c to 3.15c; No. 20, 3.05c to 3.20c; Nos. 22-24, 3.15c to 3.30c; Nos. 25-26, 3.25c to 3.40c; No. 27, 3.35c to 3.50c; No. 28, 3.45c to 3.60c. The above are for one pass through cold rolls. For full cold rolled the extra is .10c. Galvanized sheets are quoted 70 to 70 and 5 off list.

OLD MATERIALS.—The local situation is unchanged and quotations maintain strength in all varieties of scrap. The continued scarcity of material has developed a feverish condition with the persistent demand for supplies. We give current prices for Cleveland delivery, all in gross tons, as follows:

Old steel rails, rolling mill lengths	$17 50 to 19 00
Old steel rails, short lengths	16 00 to 17 00
Iron rails	23 00 to 24 00
No. 1. railroad wrought	17 50 to 19 00
Mill scrap	15 50 to 17 00
No. 1. machine scrap	15 00 to 15 50
Machine shop turnings	13 00 to 13 50
Cast borings	7 50 to 8 50
Grate bars	9 00 to 10 00
Sheet iron	9 50 to 11 00
Stove plate	10 00 to 11 00
Car wheels	16 00 to 17 00
Heavy steel scrap	17 00 to 17 50

CINCINNATI.

March 19.

The iron trade is in an anomalous condition as far as pig iron is concerned. It is impossible to state exactly what price prevails. The trade is divided; one-half insisting that Southern iron should be quoted no higher than $12 for No. 2 at Birmingham and the other half insisting just as forcibly that there is no iron to be had at $12. If $12 were taken as a minimum price and the outside price at which some concerns claim to be selling taken as the maximum, there would be a range of $1.50. The figures quoted in this report for the Cincinnati market last week are claimed by the interests selling at the lower prices to be about right. It was stated here today that there was a possibility of an advance of $2 a ton in Southern irons, but no information has come to bear out this prediction. As a result of this peculiar condition there is a good deal of trouble in getting iron at all, and consumers are in the dark

and the agents of the large producers are also somewhat at sea.

In the trade for finished material conditions are very good; the demand is steady, prices are firm and deliveries are not much longer than they have been. There is a possibility that an advance may be made in bar steel, but so far prices quoted last week maintain. The consumers of finished material are having good business in all lines. Machinery manufacturers are running in full, some of them with night forces and all of them report a satisfactory condition. Manufacturers in such lines as agricultural implements, buggies and specialties of all kinds say that the outlook is very good, and about the only troublesome thing in the situation is their inability to get material.

PIG IRON.—During the past week orders have been somewhat curtailed on account of the fact that consumers have been disappointed in their efforts to get previous orders filled. It is a known fact that some interests that insist on keeping prices of No. 2 foundry at $12 Birmingham are not offering to sell iron at that price for delivery any time within 6 or 8 months. They say that they do not want it to be considered that they are out of the market, but that for the time being they are not looking for business. A conference has been held in the East, at which it has been expected that an advance of $2 will be decided upon, but so far nothing has been heard of such a move.

Sales have been made at higher prices than $12 by some producers, and it has been claimed that even the larger concerns have sold iron on the basis of $12.50 to $13 Birmingham, though this last is without proof. During the past week No. 1 soft has sold at Cincinnati at $16.50, while quotations that have been ruling and that are claimed to be still correct are $15.25 to $16.75.

An importation about two weeks ago of 3,000 tons of English iron has been sold this week at an advance of $2 a ton by the Cincinnati firm bringing the iron in. A Northern producer has advanced prices of Northern foundry 50c a ton; another producer in the South has issued instructions to its agents that it positively will not entertain any prices less than $14 for No. 2 Birmingham. Charcoal iron has been in demand and is selling at $20.75 Cincinnati. Some large transactions have been reported, ranging from 1,500 tons to 6,000 tons, the latter order being for 3,000 tons of No. 2 foundry and 3,000 tons of car wheel.

The following quotations are considered fair. It is probably in order to consider the higher prices that some producers are getting for their iron as in the nature of premiums for early delivery. In giving a range of about $1.25 on the various grades it is taken into consideration the fact that several interests show positively on the one hand that they are selling iron at the lower figure, while on the other hand other interests show just as positively that they are selling at the higher figure. Giving both the benefit of the actual prices that they are getting, the quotations are as follows:

Southern Fdy. No. 1	$15 25 to $16 50	Gray Forge	$13 75 to $15 00
" " 2	14 75 to 16 00	Northern Fdy. No. 1	17 85 to 18 75
" " 3	14 25 to 15 50	" " 2	17 35 to 18 25
" " 4	13 75 to 15 00	Southern C.W. iron	20 00 to 21 25
So. Fdy. No. 1 soft	15 25 to 16 50	Malleable coke iron	17 60 to 18 60
So Fdy. No. 2 soft	14 75 to 16 00		

FINISHED MATERIAL.—While there has been no change in prices there has been a good demand from all sources. One important concern has stated that an advance in the price of bar steel the latter part of the month might be expected, though at the present time there is nothing on which to base this prediction, other than that the demand is good and some of the producers are practically out of the market on steel bars. Prices are: On bar iron, 1.82c; on steel bars, 1.72c. Angles remain at 2c; plates at 1.85c; sheets, No. 28, 3.35c to 3.40c; No. 12, blue annealed 2.35c.

OLD MATERIAL.—There has been a firmer tone to the scrap market and most all descriptions have advanced. There has been a good demand for old material and notably for axles and rails. The movement in rails has been light, owing to the fact that the weather and the absence of cars has resulted in the refusal on the part of railroads to load and deliver them. It is expected, however, that when the weather opens into spring the movement of rails will be considerably augmented. Prices of wrought railroad, machine scrap, axles, plates, turnings and borings have all advanced from 25 to 50 cents. We quote f. o. b. Cincinnati as follows:

Old No 1. Wrought Railroad, net tons	$ 17 00 to 17 50
Cast Machine and Foundry, net tons	12 75 to 13 25
Old Iron Rails, gross tons	21 50 to 22 00
Old Steel Rails, gross tons	18 00 to 18 25
Old Short Lengths, gross tons	15 25 to 15 50
Old Iron Axles, gross tons	21 50 to 22 00
Old Iron Car Wheels, gross tons	16 00 to 16 50
Stove Plates, gross tons	9 75 to 10 00
Wrought Turnings, net tons	11 75 to 12 00
Cast Borings, net tons	6 00 to 6 50

PHILADELPHIA.

March 18.

From present indications many manufacturers will be compelled to curtail their output during the next two or three months until the supply of iron becomes more plentiful. The scarcity of material applies to practically every form of finished product, and with nearly all of this under contract for future delivery, advances in prices cut but little figure. It is expected that by midsummer the present stringency will have been relieved, but what bothers those who have orders to fill is to keep going in the interim. There being very little material for sale, intending purchasers realize the folly of attempting to place orders for that which cannot be delivered. Business may therefore for the present be said to be confined to small transactions where the goods are in sight.

PIG IRON.—With only a few days' supplies on hand it is found extremely difficult to keep mills and foundries steadily in operation and the smallness of stocks does not give much encouragement to expect easier conditions. Both buyers and sellers seem to have tacitly agreed to let the future take care of itself, their efforts being principally devoted to meeting the emergencies arising from day to day. We quote below the range of prices at which it is believed transactions are taking place, though it should be understood that even at these values it is doubtful if holders could be found of anything but very small lots for delivery this side of July: No. 1 X foundry, $19.50 to $20.50; No. 2 X foundry, $18.75 to $19.25; No. 2 plain, $18 to $18.50; standard gray forge, $17.50 to $18; ordinary gray forge, $16.75 to $17.25; Basic (chilled), $19.25 to $20.

FINISHED MATERIAL.—Structural shapes lead the market in scarcity; and the bar mills also appear to be somewhat handicapped in making prompt deliveries. A great deal of new business is being offered in all departments. While nominal prices continue to be quoted it is well known that in most lines premiums are paid to insure prompt attention. For seaboard and city deliveries quotations are made as follows: Plates, ¼-inch and thicker, 1.75c to 1.80c; bars, iron or steel, 1.75c to 1.85c; angles, 1.75c to 1.85c; beams and channels, 1.75c to 1.85c.

OLD MATERIAL.—Extreme scarcity prevails and holders are not disposed to sell except at outside figures. A great deal of variation exists in prices, but the following quotations are believed to represent the range for deliveries in buyers' yards: Choice railroad scrap, $22.50 to $23.50; ordinary light scrap, $13.50 to $14; machinery cast, $15.50 to $16.50; heavy steel scrap, $19.50 to $20.50; old iron rails, $22 to $23; wrought turnings, $14.50 to $15; cast borings, $8.50 to $9; old iron axles, $25.50 to $26; old steel axles, $22.50 to $23; old car wheels, $17.50 to $18.

The Green Engineering Co., Chicago, reports a great number of sales so far this year of its traveling link chain grates, among the orders taken being the following: American Tin Plate Co., 6,000-h. p.; Union Steel Co., 6,000-h. p.; American Steel Foundry Co., St. Louis; Crane Co., Chicago; Armour & Co., Kansas City, East St. Louis and Chicago; Cudahy Packing Co., South Omaha, repeating order; Danville, Ill., Street Railway & Light Co., repeating order; Ballard & Ballard Co., Louisville; Emery, Bird, Thayer Co., Kansas City; Cleveland Worsted Mills, and Norwood Water Works. The number of orders received and those the company is asked to figure on certainly indicate that the builders of the best plants consider this grate to possess qualities worth careful investigation.

W. J. Chalmers, of the Allis-Chalmers Co., has sailed for Europe for an extended trip.

At Moline, Ill., a conference between representatives of the Iron Molders' Union and the National Founders' Association resulted in an agreement on a $2.75 minimum, which was the basis asked by the molders.

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

PUBLISHED EVERY THURSDAY BY

THE IRON & STEEL PRESS CO.,

ROSE BUILDING, CLEVELAND, OHIO.

G. H. GARDNER, President and Treasurer.
JOHN A. PENTON, Vice-President.
A. I. FINDLEY, Secretary.

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CHICAGO : 934 Monadnock Block, GEO. H. GRIFFITHS, Manager.
PITTSBURG : 429 Park Building, A. O. BACKERT, Manager.
NEW YORK : 150 Nassau St., D. C. WARREN, Manager.
CENTRAL WESTERN REPRESENTATIVE : R. A. EVANS.

Subscription, $3.00 per annum. To Foreign Countries, $4.00.
Advertising Rates Furnished on Application.

The Cleveland News Co. will supply the trade with THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER

MARCH 20, 1902.

THE PROBLEM OF AMERICAN MACHINE SHOPS.

We printed in our issue of Feb. 20 the agreement drawn up by representatives of machinery manufacturers and the officers of the machinists', or engineers', unions in Great Britain. While the officers of the Amalgamated Society of Engineers, the Steam Engine Makers' Society and the United Machine Workers' Association sanctioned the agreement it failed of ratification when the unions voted upon it. Only 26,277 members out of a total of 110,000 voted at all; of these 9,714 were for and 16,563 against the agreement. However, the fact that the non-voters did not actively oppose the measure, and the existence of some misunderstanding of the provisions on piece-work, taken in connection with the unanimous approval of the document given by the officers of the unions, make it probable that there will yet be a confirmation.

The significant fact is that after four years' experience under the conditions which the employers put in force after the defeat of the men in the engineers' strike of 1898, the representatives of the unions should have been willing to incorporate these identical shop regulations in a permanent agreement. It indicates that free management of shops by proprietors, freedom of the employe to belong to a union or not, the absence of limitation of apprentices, and the right of employers to work piece work, is not such a disastrous program for the workman as many union leaders would have him believe. When these conditions were introduced in English machine shops after the men had been beaten in their strike for control of shops, machines, output, apprenticeship and all, the English machinists accepted them as war measures, determining to end them at the first opportunity. Four years of intercourse between committees of employers and employes, as provided for in the settlement of 1898, have so far cleared away misunderstandings that the union officers assent to an agreement conceding them nothing but the right of collective bargaining, insurance against displacement by non-union men and the proviso that piece work rates shall not be such that a man may not earn as much as under time wages.

The upshot of it all is that the British machinists' unions are conceding without contest, after four years of education under the free shop regime, vastly more than the International Association of Machinists is willing to concede in the United States. The machinists union in this country thus stands squarely in the way of giving to American machinery manufacturers even equal advantage in the international race, with those of Great Britain. The common thinking assigns pronounced advantages to American manufacturers in the matter of freedom from union restrictions; but the tables are now to be turned.

A chapter in the actual working out of the problem at home appears in another column of this issue. While President O'Connell, of the machinists' union, promises his men victory in their efforts to restrict shop output, to limit apprentices and handy men, and to deprive non-union men of opportunity to work, the Allis-Chalmers Co. and its new employes are harmoniously working out a system under which output and the workman's wages are increased at the same time. Whatever may be the outcome of local struggles, in which one side and then the other will gain temporary advantage, we cannot but feel that the policy which experience has commended to union leaders on the other side will dominate our own machinery industries in the end. It is based on mutual recognition of rights, and on the proposition that every man's skill and industry are entitled to the return that belongs to utmost endeavor. To follow the lead of the O'Connells is to invite sure defeat in our campaign for international trade, and is simply trailing after the discredited regime of our British competitors.

CONTINUOUS BAR SHEET AND TIN PLATE WAGE SCALE.

While representatives of the Amalgamated Association of Iron, Steel and Tin Workers have entered into agreements with the American Tin Plate Co., American Sheet Steel Co. and the Republic Iron & Steel Co. for a continuation of the present tin plate, sheet and bar iron scales for one year ending June 30, 1903, it is not to be inferred that these agreements cannot be declared null and void at the coming convention of the association in Wheeling on April 15. The three committees representing these crafts, with President Shaffer at their head, have signed agreements, it is true, for the continuation of these scales through another scale year, but the agreements are only morally binding on the association, not legally.

This point is one not to be overlooked, especially when the executive head of the association is to be called to account at the convention in Wheeling next month for waging one of the most disastrous labor wars ever carried on in this country. That President Shaffer will have strong opposition for re-election is already apparent and not only his opponents but many of his own following are up in arms over the signing of these agreements. They contend that these committees have usurped the power of the convention, and while their action is strictly in accordance with the constitution of the association, they declare they are in favor of repealing the clause giving the executive officers authority to agree upon scales without first submitting the conditions and terms to the convention. Section

3, of Article 3 of the association's constitution, which apparently gives the executive officers the authority to agree upon scales, morally binding the organization, reads as follows:

In the event of any body of manufacturers desiring to meet representatives of our association any time after December of any scale year to discuss and arrange a scale or scales for the following year, provided that all such scales shall always commence the July succeeding and end on the 30th of June following the date of commencement, the president shall appoint a committee to hold such conference, a minute report of which shall be sent to the sub-lodges as early as practicable.

That the present administration of the Amalgamated Association has some misgivings over the reception the convention will give its action is indicated in a report of the recent conference with the American Tin Plate Co. appearing in the last issue of the *Amalgamated Journal*, the official organ of the association, from which we take the following:

The details of the conference have been sent to the lodges directly interested, and it behooves every member concerned in this matter who desires to know the reasons why the committee negotiated the scale of wages to attend the next session of his lodge, or if a special meeting is called for its consideration, do not fail to be present. It is not fair to indulge in wild speculative discussions outside the lodge room on a question of such importance as this one is, but rather patience should be exercised until the whole matter is laid before the sub-lodges in an official manner; then each member can decide in his own mind whether the committee has done the best thing under the circumstances for the general welfare of the organization. That is the important conclusion to be reached in this case.

Owing to the moral obligation involved in the preliminary agreements every effort will be made by the present officers to have their action ratified, but it is doubtful if this will be done without sharp contention on the floor of the convention.

The figures of the Western Pig Iron Association show that pig iron production in February was 1,284,520 tons, against 1,459,325 tons in January. The falling off does not so much indicate that railroads did greatly poorer work in February than in the month preceding. The February output would have been but 34,000 tons instead of 175,000 tons less than that of January had there been 31 days instead of 28. According to the *Iron Age* figures, the production March 1 was at the rate of 330,710 tons a week, as against 340,612 tons a week on Feb. 1. The total of stocks of pig iron at all furnaces, leaving out steel company stocks which may be reckoned as practically nil, was 127,054 tons on March 1, or 30,429 tons less than on Feb. 1. Stocks are now at the level reached in November, 1899, just before they began on the record of steady accumulations that was made in the following twelve months. Less than a two-days' supply is now on hand.

M. M. Garland, formerly president of the Amalgamated Association of Iron and Steel Workers, and Joseph E. Ralph, a steel worker, of Joliet, Ill., appeared before the House Committee on Labor at Washington, D. C., last week, to combat the claim of Supt. Dinkey, of Homestead, and Supt. Johnson, of Bethlehem, that an 8-hour day in works filling government contracts would be detrimental. Mr. Garland said that under the 12-hour system men were changed at the melting furnaces without any detriment to the steel. He argued that the 8-hour day could be introduced without injury to the steel produced. Answering questions based on the testimony of Supt. Johnson, Mr. Ralph said: "Mr. Johnson says that it took four furnaces to melt the steel for this casting. Now on each one of the furnaces there was a man. If it was impossible to change a shift during a heat on account of spoiling the metal, why would not the metal be spoiled by the different process which might be used by these four men. As a matter of fact the metal from these four furnaces all goes into one mold and is exactly the same in texture and quality." Judge McCammon, representing the manufacturers, wanted to know if Mr. Ralph was unaware that all the four furnaces might be employed to make one casting with a man at each, but that the whole four were in charge of another man, a superintendent. This, Mr. Ralph contended, made no difference; that the men who had charge of the furnaces were the only ones who could influence the quality of the heat or metal.

Frank H. Czarniecki retired from the firm of Smith & Czarniecki, of Pittsburg, on March 15. The business will be conducted by the Charles G. Smith Co., representing the Safety Emery Wheel Co., of Springfield, O.; the Wilmarth & Norman Co., of Grand Rapids, Mich.; the George Gorton Machine Co., of Racine, Wis.; the Eastern Machinery Co., of New Haven, Conn.; and Hill, Clarke & Co., of Boston and Chicago. Mr. Czarniecki will represent the Western Mfg. Co.'s line of lathe, planer and shaper tools. Both addresses will remain the same—347 Fifth avenue, Pittsburg.

It is officially announced that the $15,000,000 new stock of the Lackawanna Steel Co. has been largely over-subscribed by the stockholders of the old concern.

The statement in our last issue concerning the foreign engines ordered for American steel mills was incorrect in the inference that all the engines for the new open-hearth plant of Wickwire Bros., Cortland, N. Y., had been ordered abroad. The Wm. Tod Co., of Youngstown, O., has the contract for one—a pair of 30x36-inch geared reversing engines.

At a meeting of the directors of the West Virginia Bridge & Construction Co., of Wheeling, W. Va., held at Pittsburg this week, officers were elected as follows: Edward Hazlett, president; George A. Laughlin, vice-president; C. E. Wincher, secretary and treasurer, and J. H. Barrett, general manager.

At a meeting of the stockholders of the United States Wire & Nail Co., of Pittsburg, Pa., to be held within the next two weeks, the proposition to increase the capital stock from $300,000 to $1,000,000 will be considered. The company has a wire, nail and rod mill at Shousetown, Pa., with a daily capacity of 200 tons. It is to provide raw material for the plant that the increase in capitalization is required. It is probable that an open-hearth plant will be erected.

The Stilwell-Bierce & Smith-Vaile Co., of Dayton, O., announces that P. B. Fenlon is no longer manager of its Philadelphia office, located at 612 Arch street, being succeeded by O. G. Smith, who has been with the company for the past two or three years in the air compressor department. A. L. McClurg, who for the past six years has been connected with the Harrison Safety Boiler Works, has also recently entered the employ of the Dayton company. He will sell feed water heaters, pumps, etc., working in connection with the Pittsburg sales agent, E. F. Austin.

The J. W. Paxson Co., of Philadelphia, has opened a branch in Baltimore. The address is room 1102 Union Trust building, corner of Charles and Fayette streets. W. Scott Thomas is in charge.

James Ross, president of the Dominion Iron & Steel Co., of Sydney, Cape Breton, is in England, and his trip has been given some significance in connection with the export trade his company seeks to build up.

From the Lorain Steel Co., Lorain, O., we have received a large framed picture of its works. Two panoramic views are given, reproduced by the Albertype process—the one showing the steel works, and the other the blast furnace plant, with docks and ore yards, ore handling machinery, etc.

BLAST FURNACES AND STEEL WORKS PROJECT FOR CANTON.

(Special Telegram.)

PITTSBURG, *March* 19.—Officers of the Stark Rolling Mill Co., Canton, O., are in the city today in conference with Julian Kennedy with reference to the erection of a blast furnace at Canton. Plans have been prepared for the erection of two 35-ton open-hearth furnaces, but it is altogether probable that a Bessemer steel converting plant will be erected in place of the open-hearth plant. Plans for the blast furnace have been under preparation for some time, as already published, and the work of erection may be commenced shortly. The steel produced in this plant will be finished in the mills of the Stark Rolling Mill Co., Carnahan Tin Plate & Cheet Co., and the Berger Mfg. Co., all located at Canton. The output will not only be sufficient for these plants but it is probable that there will be some for the open market.

United States Steel Corporation Bonds.

The plan of the United States Steel Corporation for the retirement of $200,000,000 preferred stock and the issue of $250,000,000 5 per cent second mortgage bonds is said to be well advanced. An underwriting syndicate has been formed which is to deliver 1,000,000 shares of preferred stock and agree to take $25,000,000 of the extra issue of $50,000,000 bonds. All holders of the preferred stock will have the privilege of exchanging 40 per cent of their holdings for the new bonds. The $50,000,000 to be realized by the new plan is expected to be devoted to acquisition of ore properties, to extensive improvements and possibly to the acquisition of other companies. The American Tin Can Co. and the Bethlehem Steel Co. are mentioned in this connection. The $200,000,000 of preferred stock to be retired now calls for $14,000,000 in dividends each year. The bond issue of $250,000,000 would require but $12,500,000, so that the new plan would yield $1,500,000 a year for sinking fund. It is reported that the finance committee of the corporation estimates that the carrying out of this plan will result in an annual saving of $10,000,000, or one-half the common stock dividend, in the operation of some of the subsidiary companies.

The new Frick building at the corner of Grant street and Fifth avenue, Pittsburg, owned by H. C. Frick, will contain the headquarters of some of the largest steel interests in the country after April 1. Among the companies that will move to this building are the National Tube Co., Crucible Steel Co. of America, American Bridge Co., Standard Chain Co., Pressed Steel Car Co., American Steel & Wire Co. Union Steel Co. and a number of smaller independent steel interests. Adjoining this building is the Carnegie building which is the headquarters of the Carnegie Steel Co., American Steel Hoop Co., National Steel Co. and the American Tin Plate Co.

The Morgan Construction Co., of Worcester, Mass., has been awarded a contract by the Republic Iron & Steel Co. for the roughing rolls and the furnaces for the Williams guide mill at the Brown Bonnell plant at Youngstown, O., which is to be remodeled and changed into a modern continuous mill. The mill will be equipped with a Morgan suspended roof billet heating furnace, capable of heating a 30-foot billet, and a continuous roughing train.

The plant of the National Cable & Wire Co., Shousetown, Pa., will be placed in operation about April 1. The main building of the plant is 100x250 feet, and the foundry 80x250 feet. The foundry will be operated by the North Pittsburg Foundry Co. The plant will manufacture underground cables for electric light and telephone purposes.

The Haselton mill of the Republic Iron & Steel Co. at Haselton, O., resumed operations in all departments this week. Part of the mill has been off for some time on account of the shortage of pig iron.

The Sargent Co., of Chicago, heretofore operating an open-hearth steel plant at 59th street, for the manufacture of draw bars, knuckles, coupler parts for repairs, and a plant at Chicago Heights, Ill., for the manufacture of Tropenas steel castings and steel and iron brake shoes, has transferred the plant at Chicago Heights, together with the classes of business done there, to the American Brake Shoe & Foundry Co., which will hereafter conduct the business of this department from its offices at Chicago Heights. The Sargent Co. will continue the operation of the open-hearth steel plant at 59th street, where its general offices will be located.

The erection of the Griffiths Charcoal Iron Mills, Washington, Pa., is being rapidly pushed and the plant will be completed by July 1. Work on the knobbling and charcoal furnaces has already been commenced.

Two mills of the sheet plant of the Tuscora Steel Co., Newcomerstown, Pa., were placed in operation last week. The remainder of the plant will not be placed in operation for some time.

The Buffalo, N. Y., plant of the Allis-Chalmers Co., which was leased two years ago will be discontinued after June 1. This in line with the policy of centralization which will be carried out to a large extent.

At the meeting of the stockholders of the Johnson Foundry & Machine Works, Ltd., Battle Creek, Mich., held last week, officers were elected as follows: Dr. Eugene Miller, president; F. J. Walbridge, vice-president; George Taylor, secretary; A. M. Slay, treasurer, and A. Johnson, general manager. The company is the consolidation of the Johnson Machine Works and the Battle Creek Machine & Foundry Co. The erection of a new foundry will be commenced shortly.

C. P. Maxwell & Son, of Lisbon Falls, Me., have purchased the power house of the L. B. & B. Electric Railway Co., at Lewiston, Me., and will equip the same for use as a foundry. Considerable machinery will be installed.

Negotiations are now under way which may result in the early resumption of operations at the plant of the Hartman Manufacturing Co., New Castle, Pa. The proposition under consideration by the creditors is to operate the plant independent of the receiver. E. A. Henry, president of the Cuyahoga Steel & Wire Co., Cuyahoga Falls, O., is the choice of the creditors and it is proposed to give him full management of the plant. Both the Chicago and New York creditors are in favor of Mr. Henry's appointment.

At the annual meeting of the stockholders of the Compressed Air Co., of New York, held last week, directors for the ensuing year were elected as follows: H. D. Cooke, A. C. Soper, H. Monkhouse, C. S. Truax, T. B. Kent, D. C. Morehouse, C. H. Buell, A. B. Proall and N. C. Knight. H. D. Cooke was elected president; H. Monkhouse, vice-president; H. A. Hinley, secretary and treasurer. During the past year the Rome, N. Y., Locomotive Works were purchased and considerable money was expended in repairs. It was decided to expend $50,000 additional in repairs during the ensuing year.

In addition to replacing the converters at the New Castle plant of the National Steel Co. with two larger ones having a capacity of 15 tons each, the soaking pits are being completely overhauled and relined. A new bottom oven building is also being erected and will be completed shortly. The converters have been manufactured by the Pennsylvania Engineering Works, and will shortly be put in place.

No. 2 stack of the Woodward Iron Co., Woodward, Ala., was placed in operation last week after an idleness of several months. The furnace has undergone extensive repairs, and has been extensively remodeled.

Detroit papers refer to the completion of negotiations in connection with the Zug Island blast furnace project that has been discussed for some months. It can be said officially, however, that the deal is not completed, and while a furnace, in which Cleveland, Detroit and Syracuse, N. Y., capital will be interested, may be built at Delray, below Detroit. Details are not yet arranged.

CLEVELAND MACHINERY AND METAL WORKING TRADES

CLEVELAND, March 17.—The continued pressure of business is forcing manufacturers to plan for further extensions of present plants and rush those already projected to early completion. Several local firms have had plans prepared for building, but are holding them in reserve for more favorable opportunities in placing the contracts. The W. S. Tyler Co., manufacturer of wire goods, is installing an improved power plant at its works on St. Clair street, and will have a complete system of electrical transmission arranged in multiple. The line shafts will be in short lengths, each with an individual motor. The Cleveland Hardware Co. is adding new power equipment that will largely increase the capacity of the factory on Lake, Belden and Kirtland streets. The Bishop & Babcock Co. and the Cleveland Wire Spring Co. are also reported as about to undertake extensive changes in the power equipment. The Brown Hoisting Machinery Co. is completing entirely new works that will greatly increase its capacity and give it the largest plant for the construction of hoisting and conveying machinery in the world. The National Screw & Tack Co. will add equipment to the power generating plant on Stanton street in the spring. The new plant of the Wellman-Seaver Engineering Co., recently described in *The Iron Trade Review*, will be in service at an early date. The Cuyahoga Stove Repair Co. is to build a factory on Union street, and the Lennox Chemical Co. will erect substantial additions to the present plant on Willson avenue.

In the suburban sections improvements and new manufacturing plants are springing into existence. There are many benefits to be attained from locating large manufacturing industries at such points provided the transportation facilities are adequate. The Collinwood section has attracted a number of progressive plants of considerable proportions and these are showing rapid growth. The Browning Engineering Co. is adding to power facilities, the Lake Shore & Michigan Southern Railroad is completing immense car shops, the Kuhlman Car Co. is finishing a large street car factory, and other notable manufacturing developments are nearing completion. In the south-central portion of Cleveland, the Grasselli Chemical Co. is installing a new series of furnaces and largely increasing the capacity of its power-producing facilities. All the plants will be equipped with smoke-preventing appliances as a result of the vigorous campaign of the smoke inspector, Prof. Benjamin, of the Case School.

The Reliance Gauge Column Co. is running to the full capacity of the plant, and owing to the demand for steam specialties the firm is considering the necessity of an immediate enlargement of plant and working force to keep pace with orders. Those on hand will take the entire output for six months ahead and prospects of the firm have not been excelled in previous years.

The Cleveland Crane & Car Co. has been compelled to extend its facilities owing to the great increase in business and will soon move into the new plant at Wickliffe, O. This factory is now in course of erection, and will have a capacity of about double that of the present plant at Cleveland.

The business of the Cleveland Pneumatic Tool Co. is constantly increasing and additions to the equipment of automatic machinery are being made. The firm reports the receipt of an unusually large order from an important shipbuilding company on the Pacific Coast, and says that business shows a large increase over that of 1901. It does not belong to any combination of pneumatic tool manufacturers.

The Chase Machine Co. is building a one-story brick addition to its erecting room, 30x60 feet.

The Madison Avenue Foundry Co. has been incorporated under Ohio laws, and has purchased the plant of the East End Foundry Co. on East Madison avenue, Cleveland, and is now conducting the business. The officers are M. W. Peters, president; M. W. Merriam, vice-president and superintendent; Francis B. Butts, secretary and treasurer. The above with Frederick Metcalf, treasurer of the Chase Machine Co., and A. B. Metcalf constitute the board of directors. The foundry is located on the Pennsylvania switch, and is equipped with heavy cranes and other facilities for handling large castings. Extensive improvements will shortly be made.

C. O. Bartlett & Co. has orders on hand for all the plant can do for the next three months. These orders include one large contract for building a fueling scow for the Pittsburg Coal Co., and a very large order for Portland cement machinery from the Southwestern Portland Cement Co., Kansas City, Mo. The factory is completing three orders for driers for the Chicago Portland Cement Co., Chicago, Ill.; Egyptina Portland Cement Co., Detroit, Mich., and Southwestern Portland Cement Co., of Kansas City.

A. F. Schroeder, of the Globe Machine & Stamping Co., reports that his concern has obtained a contract to build machinery used in the pearl button industry, and has entered a number of good orders for punching and forming dies. The company is now manufacturing emery wheel dressers, which will be placed on the market through jobbers. It has also designed a new dresser cutter.

W. W. Sly finds no lessening in the demand for foundry equipment. It is increasing faster than he can adapt his facilities to meet trade requirements for prompt delivery. He expects that his business this year will be fourfold that of the year before, and is looking for an increase in his foreign trade. Mr. Sly handles the Sly separator and other foundry appliances of his own invention, and is just now developing several new machines to lighten the task of the foundryman and still further reduce the time and apprenticeship required in purely manual labor.

The Elwell-Parker Electric Co. is loaded up with orders for generators, many large hoisting motors and a quantity of electric automobile equipment. The company will be compelled to plan for an increase of plant if business continues at its present gait.

The Atlas Car & Manufacturing Co. says that business is very good, but is hampered by the slow delivery of material. It carries from $75,000 to $100,000 worth of material in the yard under normal conditions and the present delay in receipt of supplies is making it impossible to guarantee deliveries in any reasonable time. Some large orders are nearing completion for smelter works. These include concentrate, calcine and charging cars with electrical driving equipment, also some heavy steel mine cars for the Northwest.

The Buckeye Steam Fitting Co. has recently moved from 117-119 River street to 3-9 Court place and has installed a complete equipment of improved machinery. Business in this line, pipe, fittings and supplies, is usually at this time of the year very dull, but all indications point to a very good spring opening.

The Standard Welding Co. is extremely busy in the tube department and in automobile work. The demand for the former product is said to be excellent and the only difficulty is in the receipt of raw material fast enough to fill orders satisfactorily. The same may be said of the material furnished for automobile parts. There is no very great activity in bicycle work though orders have been quite reasonable in size and number.

The Variety Iron Works has ordered about 60-h. p. in motor equipment from the Lincoln Electric Co. The latter company has just shipped some machines to Montana, a large dynamo to Michigan and a large motor to Pittsburg. The Lincoln Electric Co. is very busy on its general line of electric machinery.

The Cleveland Steel Co. is installing a new bar shear and unloading apparatus to enable it to handle raw material with greater facility, and this will also increase present facilities for production of finished material. In common with other independent mills it has been greatly hampered by delays in the receipt of raw material. Several months' business is on the books, and plenty of steel has been purchased, but it is not coming along as fast as expected. The plate mills of the company were shut down the latter half of February on account of the lack of steel.

P. R. Crawford is one of the directors of the Ohio Steam Generator Co., recently incorporated with a capital stock of $100,000, for the purpose of manufacturing and equipping boilers with a patent generator. Mr. Crawford expects to manufacture the generators at his plant (P. R. Crawford Heating & Manufacturing Co.) on Cooper street. The new company is a branch of the American Steam Generator Co., of New York.

The Van Dorn & Dutton Co. finds it necessary to increase the factory equipment to keep pace with rush of business. A new engine is being installed, together with other machinery.

PRESIDENT SCRANTON ON THE BUFFALO WORKS.

In a recent newspaper interview President Walter Scranton, of the Lackawanna Iron & Steel Co., who will also be president of the Lackawanna Steel Co., spoke in general of the plans of the company which are being carried out at South Buffalo, and of the advantages afforded by the new site. Instead of 800,000 tons a year of finished product, as originally planned, the company, he said, now intends to produce 1,250,000 tons a year, having enlarged its plans to take in an open-hearth plant so as to make structural steel and plates.

"This plant will be, naturally, the most modern, as it is the latest, but it will have certain other advantages over most steel plants which have grown gradually from small beginning. Ours is planned complete and arranged, not by a series of additions, but from the ground up. We expect to have not only the largest single plant, but by far the most scientific and effective plant. I think it is pretty generally understood that we are prepared to take care of ourselves without any outside assistance, from start to finish. The company owns interests in Lake Superior ore properties, in Pennsylvania ore properties and in Adirondack ore properties. We have our own coal fields and our terminal railroad, which connects us with 28 different lines. But all of these factors for a complete plant, working under the most advantageous conditions, might have been got in some place other than Buffalo. In Buffalo we have the additional advantage of the lake shipment and the canal. Everything that Mr. Carnegie says about the facilities that the Erie Canal, under present conditions, would give to Conneaut, is true about Buffalo. So far as we are concerned, there is another great reason for the canal helping us. The iron ore of the Adirondacks would naturally come to Buffalo as a return load in canalboats, which otherwise would run empty, after taking grain to the seaboard.

"We came to Buffalo by the process of exclusion. We must remember the Lackawanna Iron & Steel Co. at Scranton had been a prosperous business for about 60 years. It had a line of customers that it did not want to lose. Any location that would not enable it to serve old customers as well as it could from Scranton would involve a very considerable loss. But from Buffalo we can serve our large Eastern trade and our large trade in New England and the seaboard as advantageously as we can from Scranton. A large part of our Western business was going through Buffalo and, of course, all that business we can serve better from Buffalo than from Scranton.

"The prospects of the future are for the West and the Orient. That trade we can serve from Buffalo as well as it can be served from South Chicago. At Stony Point we can ship in vessels lying in our canal and have them go direct to Duluth. A few miles, more or less, on the lakes counts for very little. It is the shipping and the unloading that are the great items in water transportation. So I feel there is not and can not be any steel plant in the United States which will have, for distribution, any material advantage over us. So much for distribution. With our trade, as it stood, there was no better place for distribution than Buffalo. For the assembling of our material, as I said before, there was no place could equal it. The ore from Lake Superior, from the Adirondacks and from Pennsylvania, could be assembled at Buffalo more cheaply than at any other one point and our coal properties were within easy and economical reach. So you see, for the Lackawanna Iron & Steel Co., Buffalo was almost a mathematical demonstration.

"We expect to be making steel by the Bessemer process before the end of the year. The enlargement of our plans will mean that instead of this large amount of extra employment in construction ceasing at the end of this year, it will be carried on a year or so longer."

A new bridge and structural concern to be known as the West Virginia Bridge & Construction Co. has been organized at Wheeling, W. Va., with a capitalization of $500,000. J. H. Barrett, of Pittsburg, formerly with the Keystone Bridge Co., and until recently manager of the Columbia Bridge Co., will have the management of the new concern. The incorporators are C. R. Hubbard, president of the Wheeling Steel & Iron Co.; George A. Laughlin, of the Laughlin Nail Works; W. E. Stone, W. A. Wilson, J. M. Brown, J. J. Holloway, J. H. Barrett and G. E. Wincher.

WAGE SCALES LIKELY TO CONTINUE TO JULY 1, 1903.

At a conference held at Pittsburg on Saturday between officials of the American Sheet Steel Co. and the Amalgamated Association of Iron, Steel and Tin Workers, an agreement similar to that existing between the American Tin Plate Co., the Republic Iron & Steel Co. and the association, which provides for the uninterrupted operation of the mills of the constituent companies until July 1, 1903, was entered into. According to this agreement the present scale is to be paid for another year at the expiration of the present scale year on June 30. The American Steel Hoop Co. is the only large company or combination that has not yet entered into an agreement with the association for a continuation of the scale, but there are no obstacles to prevent such an agreement, for the reason that the Republic Iron & Steel Co. has been granted the privilege and the same will hold good for the American Steel Hoop Co.

The closing of these agreements at this time means that there will be no change whatever in the sheet, tin plate or bar iron scales during the next year, and it is doubtful if the convention of the association, to be held in Wheeling next month, will exercise its prerogative to declare the agreements void. All such agreements as have been entered into are binding on the independent manufacturers having dealings with the Amalgamated Association, and they in turn are assured of no change in the scale for the period already agreed upon. Furthermore, there have been no changes in the footnotes of the three scales, which is a desirable feature, for the reason that the footnotes oftentimes cause more discussion than the base rates of the scales.

Neither the American Tin Plate Co. nor the American Sheet Steel Co. conceded anything in the way of signing the scale for any of the mills not under the jurisdiction of the association. However, in both cases the officials of the association have asked for a conference when the question of having the scale applicable to some of the present non-union mills will be discussed at length. It is well known that the association would again like to have back into the fold the Wellsville, O., and McKeesport, Pa., plants of the American Sheet Steel Co. and the two Pittsburg plants of the American Tin Plate Co. Whether any concessions on these lines will be made the association remains to be seen.

This early action on the wage scales is unparalled in the history of the iron and steel trade and insures continued operation of the mills for more than a year unless the convention should overthrow existing agreements.

The brake shoe combination has been completed with the following companies: The Ramapo Foundry Co. of Mahwah, N. J., the Sargent Co. of Chicago Heights, Ill., the Lappin Brake Shoe Co. of Bloomfield, N. J., and the Corning Brake Shoe Co. of Corning, N. Y. These companies manufacture and control about 50,000 tons of brake shoes, iron and steel castings, per annum, representing from $2,500,000 to $3,000,000. The American Brake Shoe & Foundry Co. will have the following officers: W. D. Sargent, president; Otis H. Cutler of the Ramapo Co., vice-president and general manager; Joseph D. Gallagher of the Lappin Co., second vice-president; H. K. Gilbert of the Sargent Co., treasurer; R. J. Davidson, secretary; W. W. Snow of the Ramapo Co., chairman of the board. The headquarters of the company will be at 26 Cortlandt street, New York.

The State Department has received from the French Embassy, Washington, notice of an international competition of motors and apparatus using alcohol for generating motive power, light and heat, to be held in Paris in May, 1902. This competition will include practical tests, after which medals and objects of art will be awarded, and it will be followed by a public exposition from May 24 to June 1, 1902. The competition includes: (1) Automobile boats; (2) lighting and heating apparatus; (3) fixed motors, locomobiles and motor groups. The exhibit will include, besides motors and apparatus using alcohol, apparatus producing industrial alcohol, receptacles for storing and transporting this product, apparatus worked by exposed motors, and compounds of alcohol. Sites for exhibition are free.

THE FACTS ABOUT THE MACHINISTS' SITUATION IN CHICAGO.

In connection with the machinists' strike last year we pointed out with what ease President O'Connell, of the International Association of Machinists, broke the New York agreement, with its proviso for arbitration, because the Administrative Council of the National Metal Trades Association insisted that questions of wages and hours being local questions must be arbitrated locally. In the course of the strike Mr. O'Connell on a number of occasions showed a capacity for reckless statements that scarcely betokened safe leadership of a movement so important.

More recently in the conflict at Chicago between the machinists' union and the Allis-Chalmers Co., Mr. O'Connell's penchant for random statement has been in evidence. We take as the basis of brief comment an address he made at a mass meeting in Chicago last week, under the auspices of the International Association of Machinists, both for the information it gives as to the program of the union and for the light it throws on the methods by which some leaders rally their forces for a cause already lost.

President O'Connell started out by saying that the International Association of Machinists had set up for its standard the universal 9-hour day, better wages, better shop conditions and recognition. During its existence the working hours had been decreased from 12 and as high as 16 hours per day, to 9 hours per day, and had increased wages of skilled mechanics from $1.50 per day, and in some instances less than that, to as high as 45 cents per hour, with overtime at the rate of time and one-half or double time pay. During the past year the I. A. of M. had secured for the machinists throughout the country 75,000 hours per day, and had been instrumental in benefiting 50,000 more employes working in the same shops.

Last May before the general strike was inaugurated, the officers of the I. A. of M. met the Metal Trades Association in New York, and told them if the manufacturers would concede the 9-hour day with a slight increase in wages, or ten hours pay for nine hours work, there would be no strike. An agreement had been entered into the year previous that the 9-hour day should be inaugurated on May 20, 1901, but as the time approached for the fulfillment of that agreement on the part of the manufacturers, members of the Metal Trades Association in conference said they had no authority to carry out the terms of the said agreement. A convention was held in New York, and the members voted to refer the whole settlement of the matter to the administrative council of that association. When the I. A. of M. met the administrative council the latter said they had no authority to act. At the time of their convention they voted to raise a very large amount of money and said they would wipe off from the face of the earth the I. A. of M., but you see we are still doing business at the same old stand, and we have grown wonderfully during the past year.

If ever a strike in this world was called, it was by an individual from Chicago, and that man was W. J. Chalmers. A conflict has been waged against the Allis-Chalmers Co. in Chicago for the past ten months. It has been a fierce struggle all through. Both sides have spent an enormous amount of money, but it is now all over—it is only a question of a settlement. (Applause.)

The strike was won generally throughout the country, though on the Pacific coast they have had a long struggle, where 2,000 or 3,000 men have been involved. There has also been a strike in the Southern railroads in several cities, where 500 or 600 men have been involved. But in the majority of the shops we won out, and we won right here in the city of Chicago, but some shops were not beaten into line. It has been deemed expedient to continue the fight against the man who was responsible for the general strike, and he has been brought into line, and now the others in Chicago are to be conquered at the next move. There are a few machinists in Chicago who are not members of the I. A. of M. The purpose of this general meeting is to appeal to them, and every measure known is to be used to secure their coöperation.

After May 1 next, every shop in Chicago where union men are employed, shall run on a straight 9-hour day, or no union man will work in that shop, and they will be forced to suspend operations. We do not want and shall not take a 54, 55 or any other hour week, where on five days the men work ten or any other number of hours, and five hours on Saturday. No shop can run in Chicago after May 1 except on a straight 9-hour day. We don't give a —— for a Saturday half holiday, and we won't have it.

I was talking today with one of the largest machinists in your city. He asked me, "What shall I pay my men as a minimum?" I said, "Why do you ask me?" He said, "Because you ought to know." I said, "$3 per day for nine hours." He said, "All right, I'll do it." (Applause.) That was one of the largest manufacturers in your city.

Of course we don't want to strike the shops here; strikes are expensive and they are a great hardship, but if the employers won't arbitrate and give us what we want, then we will fight for it until we win out. And when we get a 9-hour day, we will get an increase in wages too, and then we'll demand an 8-hour day with the same pay. If one hour is good, two are better. We have practically got the 9-hour day now. Just think what a boon it has been to all you men to knock off work at 5 o'clock, so you can get home and have your dinner by 6 o'clock, and then get cleaned up and come down town at 7 o'clock, where before you did not have time to get down town until late, if at all. Just think how much pleasanter it is to hit the pipe in early evening after your dinner, and be free from all your hard work—(Voice—And hit the "can" too). Yes, and the "can" too—and the best part of it is, you don't have to pay for it—it comes out of your employers. There is no reason why you should not have as many hours in the evening for society and recreation as your employer, and you ought to have as much money as he, too, and you can, if you will fight for your rights.

The man who does not hold a union card is not fit for society; he has no right to mingle with decent people. Why, I believe if any one is to get into heaven he has got to have a union card, and the fellow who doesn't have a card will have a mighty hard time getting through St. Peter's gate. I believe your brother who was shot down in cold blood by one of those devilish scabs is now enjoying a seat in heaven, but the fellow who committed that awful murder will find himself in hottest hell.

Now we are going to hold regular meetings all over this great city, and we are going to bring into line every machinist. We are going to have a straight 9-hour day on May 1, with more pay, and better conditions, and then we are going to go in for the 8-hour day. The employers must divide their income with us, for we are the ones who make their money. They have no right to make you slave as they do and they have all the profit and you not assert and maintain your rights.

In illustrating the way in which the machinists made money for their employers President O'Connell cited the fact that while the men got but 27 to 30 cents an hour the employers charged for machinists' work at the rate of 50 cents and upwards, intimating that the difference represented profit. The fallacy of such a statement is self-evident, but it was made to do service in arousing those who heard it The little pamphlet "Where Does the Money Go?" published two years ago by a Chicago machinery manufacturer, and reprinted in *The Iron Trade Review* of April 12, 1900, refuted in a thoroughgoing way the idea that machine shop employers are able to stand a 10 per cent reduction of hours and at the same time a 12½ per cent advance in wages without in most cases the disappearance of profit altogether. The facts presented in "Where Does the Money Go?" are a transcript from actual manufacturing operations, and show an array of expense in non-productive labor, in marketing of product and in depreciation, that never enters into the calculations of orators like O'Connell.

Actual Conditions in the Allis-Chalmers Shops.

Perhaps some allowance is to be made for the statements of President O'Connell, in view of the fact that he has not been in high favor with Chicago machinists for a year, and that he considered a certain fire of speech to be demanded under the circumstances. When he refers to the Allis-Chalmers strike as at the point where all that is lacking is a settlement to finish it, he is technically truthful; but that lack is about the largest that could be conceived. Instead of the situation being ripe for such a settlement, as he would have his hearers understand, it

is nearly all, from an outside viewpoint, that the Allis-Chalmers Co. and its present employes could desire.

Within the week the company has posted notices in all its shops at Scranton, Wilkesbarre, Buffalo, Chicago, and Milwaukee, that on April 1 a 55-hour week will be in force—10 hours a day for five days and 5 hours on Saturday, with an increase of 5 per cent. Thus the men will get for 55 hours substantially what they received for 57½ hours. This announcement has increased the harmonious feeling that exists between the company and its employes.

When it is considered that the machinists' union has concentrated its energies upon the Allis-Chalmers strike, particularly in Chicago, and that the company has fought single-handed the battle against the restrictions of a retrogressive unionism, it is surprising that so much has been accomplished. In spite of picketing and violence—(the killing of a picket, referred to in President O'Connell's speech, was the result of an attack upon workmen)—there has been a steady increase in the number of men at work. The output of the Chicago plants has increased month by month and an effective working force has been steadily built up. It is evident from what is now being done at these works that the trying days of the strike are over and that what remains is to bring up the organization to that effectiveness which is the product of time. The lingering picket details are now the chief suggestion of a strike. The shops have been filled with men, and there is no lack except that lack of a few skilled mechanics in all departments which is a feature in shops where there is no strike. In the past week the number of contract machinists employed reached high water mark.

The new conditions in the Allis-Chalmers shops permit of the working of as many apprentices, helpers and handy men as can be advantageously employed. It is understood to be the plan of the management to introduce the premium system, with its uniform result of greater economy in production, while the capable employe is able to earn much more than ever. An instance is cited of the application of this method in the foundry, where the molding of a large cylinder, formerly requiring 108 hours is now done in 68 hours. The molder gets 88 hours' pay for 68 hours' work and both employe and employer are satisfied.

The fact that men are going to Chicago from all parts of the country, and that the Allis-Chalmers foundries, blacksmith and pattern shops, as well as the machine shops, are being filled up indicates that the regime established at the Fraser & Chalmers Co.'s plant is attractive to men who want the opportunity to earn what their talent and their industry will bring them.

It would be difficult to make any estimate of what the struggle has cost thus far; but the result may come nearer to compensating for the terrible loss than would appear at first thought. The company has not only made its own fight and that of other machinery manufacturers who are crippled by union restrictions, but it has conferred a benefit upon free workmen whom men of the O'Connell stamp would deprive of the opportunity to work unless they suppress their earning power to the extent required by union regulations. The questions of hours and wages have been practically eliminated. The differences between the union and the company are substantially the matters that were at issue in the steel strike. There the members of the Amalgamated Association, clinging to superannuated ideas about mill control and mill output, were defeated by the cooperation of their employers with workmen who believed that their best capabilities would be developed under a system of rewarding brains and industry according to their product. The Chicago situation is evidently working out to a like solution.

The Whitehead & Kales Iron Works, of Detroit, Mich., contractors for steel buildings and other iron and steel construction work are to erect at Foundry street and the Michigan Central railroad, Detroit, buildings together covering 100x220 feet, with yard room 220x150 feet for the storage of structural material.

Good progress is being made on the new buildings of the Structural Steel Car Co., at Canton, O. The erection of the power house will be completed early in April.

CLEVELAND BOILER MANUFACTURERS' ASSOCIATION.

The boilermakers working in the marine and repair shops in Cleveland went on strike March 5, completely stopping work in the shops of the American Shipbuilding Co., the Cuyahoga Boiler Works, the Forest City Boiler Co., the Lake Erie Boiler Works, Long & Murphy Machine & Boiler Co., and the River Machine & Boiler Co. The men had given no notice of their intention to strike, nor had they presented any grievance or demand for better conditions or pay until about two hours before going out, when their business agent called on the various firms, stated that the men wanted $2.75 for 9 hours work instead of 10 hours, and that if it was not granted they would strike at noon. At twelve o'clock a total of 322 men, boilermakers and helpers, left the shops. The employers called a meeting promptly, and the result is that the Cleveland Boiler Manufacturers' Association was organized as a permanent institution, embracing every boiler manufacturer and repairer in Cleveland. Several shops which are not confined to marine work have had no trouble as yet, but all are standing firmly together to resist the demands of the men.

This action on the part of the employers was evidently a surprise to the boilermakers, as they had supposed their demand would be promptly granted. During the mild weather after March 1 many of the tugs and large lake boats had commenced their annual overhauling, and the men had begun the necessary repair work upon the boilers. When a sufficient number of boats had been disabled the strike was ordered in the hope that the opening of navigation would make it imperative that the work be finished. The strike is now two weeks old, and thus far no concession has been given the men, although 47 of the former employes of the American Shipbuilding Co. have returned to work in the two shops at the same pay and hours as before the strike. The local union has forfeited the support of the National body, owing to the fact that their demands were not made in proper order.

A Coremakers' Advance.

The foundrymen of Cleveland have also been discussing with their coremakers an advance in wages. Early in February the men submitted their demands, which briefly called for an increase in the minimum rate from $2.50 to $2.75 per day, and that nine hours instead of ten should constitute a day's work. This proposition was submitted to the foundrymen, who replied that they could not settle the matter until the pending negotiations with the molders had been disposed of.

On March 6 the coremakers sent peremptory letters to the various employers of Cleveland, stating that they must have a reply before quitting time on March 8. They were told that the matter had been referred to Mr. Penton, and that if John R. O'Leary, their National president, would arrange for a conference with Mr. Penton, the Cleveland foundrymen would abide by the result of that conference. A meeting was held but without result. Conference committees thereupon met and discussed the situation on Monday, March 17, with the result that a resolution granting the men a 15-cent general advance, all present shop conditions to remain the same, was adopted. The 9-hour day and the $2.75 minimum were refused by the association. The committees had only power to recommend to their respective bodies that such a settlement be accepted. The foundrymen's association ratified the agreement but the coremakers' union voted it down and asked for another conference. This the foundrymen have refused and the coremakers now have the alternative of accepting the advance or striking.

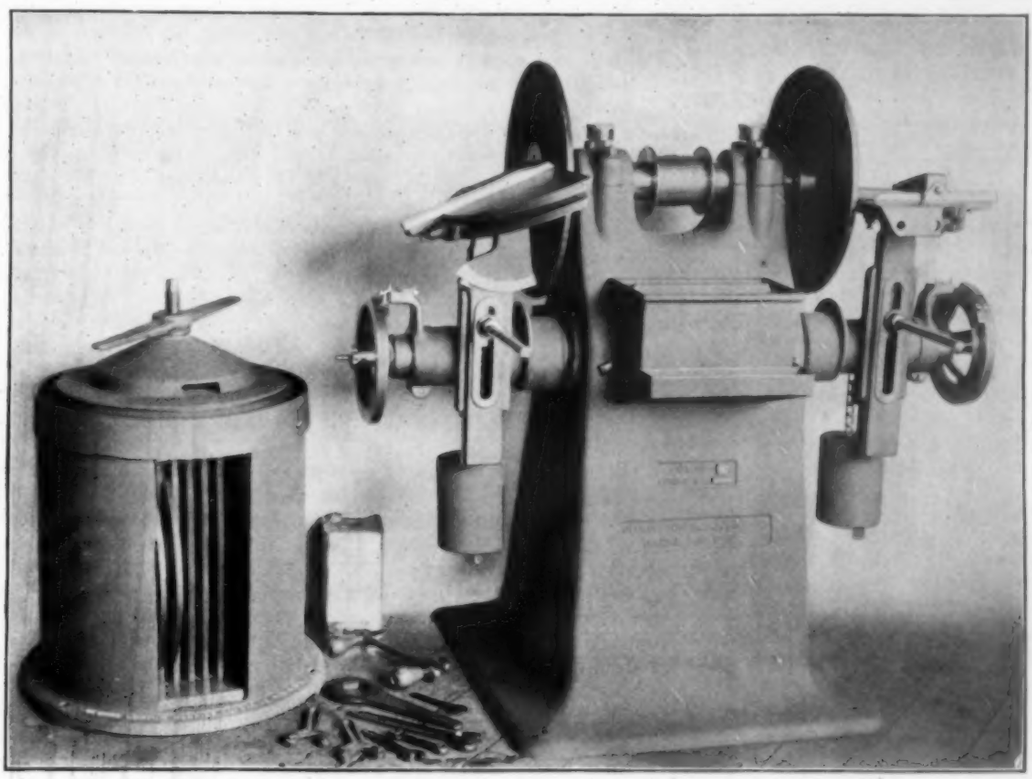
S. C. VanBuren's Sons & Co., Carey, O., is building an erecting shop 40x36 feet and has installed considerable equipment.

The Niles Boiler Co., Niles, O., announces that J. H. Orwig has severed his connection with that company and the management of its business, and that E. A. Gilbert, who has been associated with it from the beginning, has been made superintendent and secretary. Mr. Gilbert will devote his whole time to the conduct and management of the company's affairs.

The Baldwin Locomotive Works, Philadelphia, Pa., has been awarded the contract for four locomotives to be used on the new Keifu Railway, Corea, now under construction by the Japanese.

NEW DISC GRINDER FOR FLAT SURFACES.

An addition to the line of surface grinders manufactured by the Geo. Gorton Machine Co. of Racine, Wis., is shown in the accompanying illustration. The new machine is known as No. 6 and has all the features of the older product of this make, with such improvements as increased experience could suggest. Surface grinding machines are to be found on the market in considerable variety and were never appreciated as now. Grinders for the finishing of circular work such as spindles and arbors, are indispensable in the modern shop through their capacity for producing the best work in the most economical manner. What such grinders are to circular work the disc grinders are to flat work. The disc grinders are equipped with steel discs, accurately finished, to which emery cloth or paper, or carborundum cloth or paper, is cemented by means of the press shown at the left of the illustration. These discs running at the high speed of 1,800 revolutions per minute cause them to cut fast and the generous surface of the discs gives durability. The cutting discs of cloth or paper are secured to both sides of the steel discs with a quick-drying cement, used cold and requiring about fifteen minutes to dry.



A NEW UNIVERSAL DISC GRINDER.

The arbor is made of crucible cast steel, finished by grinding, and mounted in bearings adjustable for wear. All parts are made in large lots to standard gauges and are interchangeable, with provision throughout to take up wear. All flat working surfaces are carefully hand scraped to surface plates, and the completed tools are tested for accuracy in every detail. All castings are painted, filled and sanded down to a smooth surface and nicely finished. The pedestal shelving is finished in hard wood shellaced. All nuts, screws and wrenches are case hardened and all rotating parts accurately balanced. Oiling and the exclusion of grit from working surfaces has been carefully considered in the design. This is of great importance, as to be of value these tools must first be accurate, and to retain that accuracy they must be dust proof and properly lubricated. The No. 6 disc universal flat surface grinder has all graduations on large circles, which allows the operator to obtain quick and accurate adjustments.

The pedestal and headstock is a heavy one-piece casting, well ribbed internally. The arbor is 1-½ inches diameter. Both tables are automatically balanced, have a movement of 2 inches towards the discs by means of hand wheels and may be swung back and forth across the face of discs or clamped rigidly in position. The right hand table is accurately square with the face of the disc, has a vertical adjustment of 8 inches and is provided with protractor reading in degrees. The left-hand table has vertical adjustment of 6 inches, also angular setting with protractor. The countershaft is self-oiling. The steel discs are 18 inches diameter and are intended to run at 1,800 r. p. m. Four steel discs, an emery cloth cutter, disc cementing press, etc., accompany the complete machine. The net weight is 1,600 pounds.

The contract for the new 40-inch blooming mill to be erected by the Republic Iron & Steel Co. at Youngstown, O., has been awarded to the United Engineering & Foundry Co. The mill will be built by the Lloyd Booth plant. The contracts for the 8- and 10-inch mills to be erected at the Brown-Bonnell plant were awarded to the Youngstown Foundry & Machine Co.

In the foundry of the Dodge Manufacturing Co., Mishawaka, Ind., a large flywheel was cast recntly, the castings being among the largest ever turned out in this plant. The wheel was cast in two sections and each of these sections in turn was divided in halves. The wheel is 24 feet in diameter, while the belt surface is 7 feet. The sections cast had belt surfaces of 42 inches, and the entire wheel when bolted together will weigh 180,000 pounds. The shaft on which it will revolve will be 22 feet long and 27 inches in diameter. It will be used in the plant of the Kokomo Iron & Steel Co., Kokomo, Ind.

The Cleveland Steamship Co., Capt. John Mitchell, general manager, will name the new vessel now building at the Cleveland yards of the American Shipbuilding Co. after James Gayley, first vice-president of the United States Steel Corporation.

At the bi-monthly adjustment of the bar iron scale held at Youngstown, O., this week, no change in the present wages paid the members was authorized. At the present rate puddlers are receiving $5.75 per ton. It is probable that for the months of May and June the men will receive an advance, however, owing to recent advances in the price of bar iron.

Methods of Continuous Casting and Rolling For Light Sections.

BY THEO. J. VOLLKOMMER, PITTSBURG.

The prevailing method of manufacturing rolled steel shapes, whether light or heavy, is to treat the pig iron obtained from the blast furnace, in either Bessemer converters or open-hearth furnaces, from which the fluid metal is poured into ingot molds. Here the metal is allowed to cool sufficiently to solidify; then the ingots are stripped or extracted from the molds and (at least generally) deposited in soaking pits for equalizing the temperature in the different parts of the ingot. After the lapse of a certain time the ingots are pulled out of the soaking pits and reduced in size or broken down in the so-called blooming mills. In many modern mills the billets thus obtained are rolled down to the size of the finished product without reheating, only being passed from roll train to roll train on automatic conveying tables, and sheared into pieces of more convenient lengths whenever the billets attain such lengths as to render their manipulation difficult. In other cases the ingots are rolled down into billets of the desired size, sheared, allowed to cool, and stored for future use or for sale. The first is generally done in the case of finished material of heavy section, as rails, heavy beams, heavy rounds and squares, also in cases where enormous quantities of lighter and simple sections are produced, as in rod mills. For comparatively light material, however, it has always been common practice to commence the operation by heating billets and rolling them down to the desired final shape in successive passes, with or without intermediate reheating.

It is generally admitted that the above described method of casting the fluid metal into ingots of limited length, and rolling them down to the desired final shape is at present the only feasible one for heavy material generally, for any section for which there is a rather limited demand necessitating the rolling of rather small quantities at one time, and for all sections of such a shape as renders them difficult to roll. It cannot be denied, however, that the extension of this method to the production of light and easy shapes, while it was the natural course of development, is not the best where mass production is aimed at. The art of rolling metal was first developed when the available raw material was practically all puddle iron, which naturally had to be rolled from lumps, piles or fagots; and in this state of development the process of rolling was afterwards applied directly to steel billets. It is possible that had the great metallurgists of the past century, Bessemer, Thomas, Gilchrist and others, discovered their revolutionizing methods prior to the invention of the art of rolling, the first attempt at rolling steel would have been in the direction of continuous casting and rolling of bands, bars and sheets.

In the plants which are compelled to reheat billets and to roll them in the usual way, in so-called Belgian mills, aside from the expenditure for fuel and labor at the reheating furnace, considerable time is lost between the pieces, from the time one piece leaves the rolls to the time the next is gripped between the rolls. If we have such a mill, with the finishing rolls running at a rate of, say, 800 feet per minute, the production per second would be 13.33 feet. If we allow an average of 8 seconds to lapse between two consecutive pieces, the average production per second would be only 7.06 feet; or, by continuous rolling a saving of about 98 per cent could be achieved in the cost of labor alone, with the same expense for help, for a certain quantity of product, beside the possibility of dispensing with a number of men altogether. In continuous mills, working on billets, however, the saving thus derived by using continuous billets would be less pronounced, although even in the case of individual billets frequent stoppages are occasioned by the fact that the head ends of the billets are liable to split into forks (especially if the billets were sheared poorly, or worse yet, if they still had the original head), or to bend sideways, so as either to miss the next guide altogether, or to get stuck in the guide, causing the following part to become crammed and tangled up between the roll stands. It always takes considerable time to remove the string of metal; sometimes the rolls have to be removed and afterwards to be adjusted again, which in a continuous mill is far more difficult than in the ordinary Belgian train. In rolling very fine material, even the temperature of the roll, which naturally will lower during a longer stoppage, has some effect on the smooth working of the mill, and thus it generally necessitates considerable all-around adjusting and careful attention till the mill has acquired again its regular pace.

In view of these difficulties and of the considerable expense which can be saved if the rolling from the ingot down to the small size billet is dispensed with, the writer, several years ago, while connected with a plant producing mainly band and hoop steel, took up the question of casting small billets from the melting furnace directly in continuous lengths, without, however, being able to induce an actual trial of the plan. The apparatus as designed then is shown in Fig. 1, which shows the essential feature, while the arrangement of the balance of the plant could be made to suit the special and local conditions. Such a plant would consist of say two or three open-hearth furnaces, placed in line along a common charging platform of the usual construction as near to each other as can conveniently be done. Preferably they would be of the tilting type, but of course this is not essential; and at any rate for the beginning the common style of furnaces would answer quite well and would considerably decrease the cost of the construction.

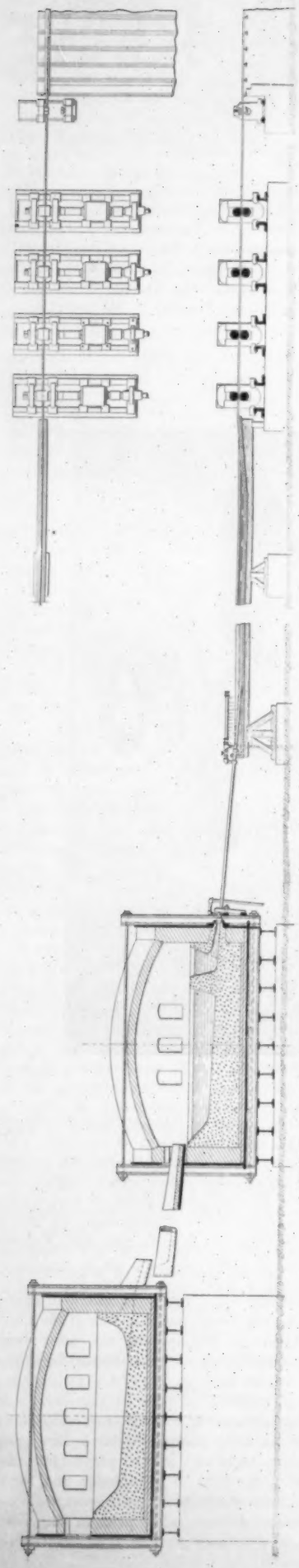


FIG. 1.—ARRANGEMENT OF OPEN-HEARTH FURNACE, RESERVOIR AND ROLLS FOR CONTINUOUS CASTING AND ROLLING.

In Fig. 1 furnaces of such well-established style are shown. From each discharge spout a trough is laid to the receiving opening of a heated reservoir built on the lines of the well-known pig metal mixers, and serving a similar purpose. Its main advantage, however, is the possibility of regulating more evenly the height of the molten metal, and of making the mill and the furnaces more independent of each other. It would give, also, a chance of relieving the furnaces of the metal more quickly, making it possible to regulate the chemical constituents of the metal more closely, and allow the furnaces to be prepared for the next heat. This reservoir would best have, in imitation of the well-known

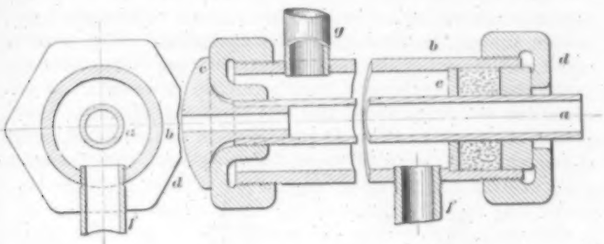


FIG. 2.—CONSTRUCTION OF MOLD PIPES

tank furnaces for glass, a couple of cross partitions, with openings for communication near the bottom, which would allow the metal to pass, while the lighter slag floating on the top of the metal would be retained by these cross walls, and prevented from flowing into the molding pipe.

In the last partition of the reservoir notches for tap holes would be arranged, located somewhat below the level of the bottom of the hearth, so as to be able to drain off all the metal. Into these tap notches the molding pipes would be inserted and rammed in tight with fire clay. It will be advisable to use two or even three of these mold pipes, so as to have one always ready, in case anything should happen to the one in use, or intended for use. The construction of these pipes is shown in Fig. 2. A seamless drawn steel tube, a, with a hole of exactly uniform cross section and well smoothed and finished, is inserted into a larger tube b, where it

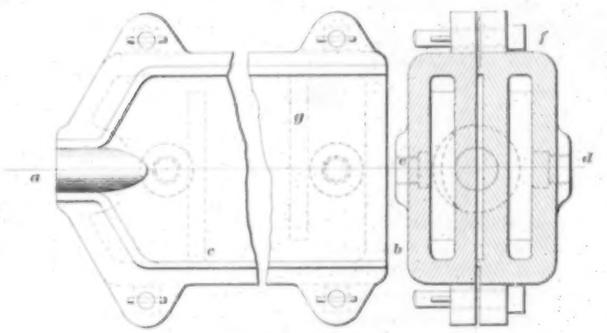


FIG. 3.—SPLIT MOLD WITH WATER JACKET.

is held centrally in place at one end by an ordinary head c into which both pipes are screwed, and by an expansion joint in the shape of a stuffing box at the other end. Two connections f and g for either hose or pipe lead the required cooling water into the annular receiver or cooling space between the pipes. A mouthpiece of refractory clay or other suitable material extending into the mold-tube far enough to prevent the overheating of its threaded and most exposed end, and fitting the shape of the head of the mold, is placed against the tap notch and rammed tight with fire clay; the tail end is located in the direction of the first roll or pass. For starting, a rod of nearly the diameter of bore of the pipe is stuck into it, one reduced end sticking through the mouthpiece into the furnace, the other extending a couple of feet beyond the stuffing box, so as to be able to get a good hold of it with tongs or grips. The minute space between the inside of the pipe, and the rod is filled with clay and graphite, so as to prevent the metal, oozing between the rod and pipe and solidifying there, from obstructing the easy pulling out of the rod. When everything is ready, a chain is attached to the end of the rod, pulling it slowly toward the first roll. The rod which acted as a stopper, and the inner end of which welded, or at least got heated to the welding point and united with the liquid metal, again solidifies while passing through the molding pipe and forms a continuous string of hot metal.

The cooler end of the rod is clipped off, and then the red-hot string is run into the first set of rolls. The length of this pipe, of course, depends on the thickness of the ingot rod, and the speed of casting. Allowing a fall of 600 degrees in temperature, from the liquid state of the steel in the reservoir,

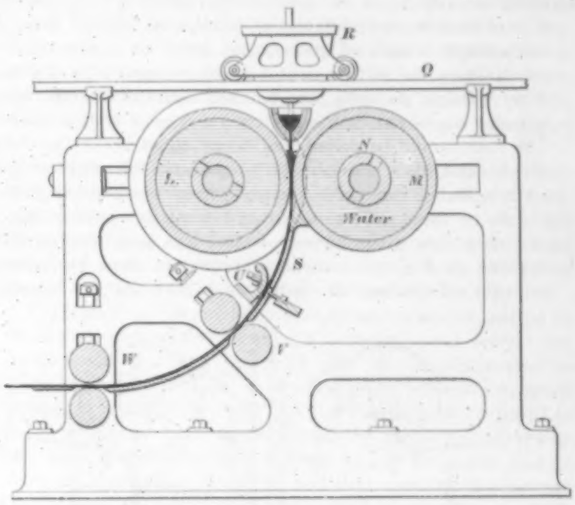


FIG. 4.—BESSEMER DESIGN FOR DIRECT MANUFACTURE OF SHEETS FROM CONVERTER METAL.

to the solid state, as it emerges from the molding tube, and assuming a diameter of one inch of the mold pipe, and a production of 360,000 lbs. in 24 hours, or 250 lbs. per minute, the metal has to run at the rate of 93.6 feet per minute, or 1.56 feet per second.

To judge from a number of nearly analogous cases, this cooling down from 2,700 to 2,100 degrees, under these circumstances, will take about 10 seconds so that the pipe will have to have a length of 15.6 feet. This length will be ample to prevent the liquid steel, standing under the pressure of a certain column of liquid, or "head," from pushing the rod out of the pipe in consequence of this pressure, while the liquid metal will fill the space evacuated by the moving and

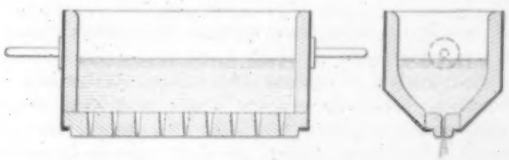


FIG. 5.—SECTIONAL VIEWS OF METAL RESERVOIR, ENLARGED FROM FIG. 4.

cooling rod, or billet. Judging from a number of observations of cases where molten or red-hot iron was run or moved over solid iron, there is no danger that the inner molding tube will wear out fast. On the contrary, the amount of wear will be entirely insignificant compared with that of any sliding surfaces of hard materials. As is well known, iron and steel have the greatest volume just at the point of solidifying. The billet will, therefore, fill the hole in the pipe exactly at the spot where the solidification has taken place, while further toward the discharge end of the molding pipe, the cross section of the billet slightly decreases, allowing just enough free play to let the billet pass without the need of exerting too much pull.

The mill itself may be of the usual type, consisting of 4 or 5 continuous stands, according to the size of the continuous billets and the final shape. When emerging from the mold pipe, sufficient opportunity has to be allowed to cool the metal

to nearly the finishing temperature, as the amount of time required for rolling will be so short that the fall of temperature during this operation will be very small. This cooling can be accelerated by running the rod through a trough of water, or by sprinkling water over it. In a continuous mill where materials of such continuous lengths are to be rolled, the usual arrangement of running all rolls at fixed speeds cannot well be used, as the loops forming between the rolls would assume such formidable dimensions as to bring them beyond control. One way to overcome this trouble is the application of differential gearing, whereby the main part of the power is furnished by any desirable source of fixed speed, while the regulation of speed, within about 3 to 5 per cent is furnished by the differential mechanism, driven from an independent source of power, the speed of which may be regulated by the fall or rise of a roller running on the loop. After passing the rolls, the finished material (bands, hoops or rods) can be handled in the same way as is done at present. The rods would be coiled, the hoops could be cut by flying shears, and then moved slowly sideways on cooling beds, while a double removable trough conveyor would carry them to two or three coiling machines behind the cooling bed, in case they should be shipped or stored in long lengths. The drawing in Fig. 1 is intended merely to show the general principle of continuous casting, and does not pay attention

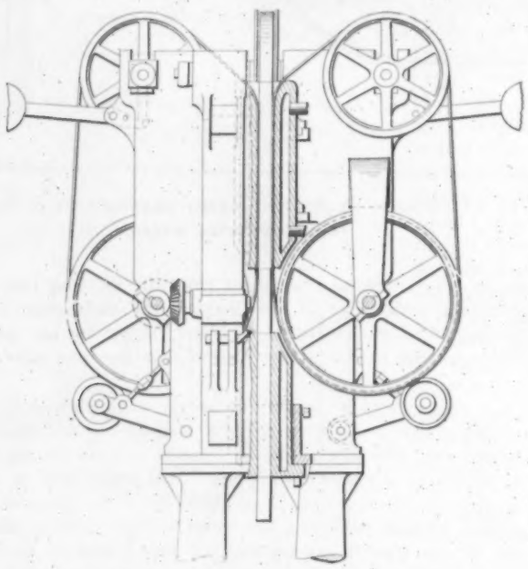


FIG. 6.—WOOD'S DESIGN FOR DIRECT ROLLING.

to details or accessories, such as the differential gearing, shears, coilers, etc.

This method of casting and rolling continuously will be especially applicable to very simple and light sections, as rods, rounds, squares, and light flat shapes, as hoops and bands. For wider shapes, as sheets, the mold would have to be modified, so as to cast a flat billet of limited thickness. The construction of a closed mold for this purpose would present considerable difficulties, if it would prove at all serviceable. The simplest way would be to make the mold split, in halves, as shown in Fig. 3. Starting again with a round feed opening a, of very short length, this opening or hole would widen out to the width of the desired billet, and be simultaneously reduced in thickness, so as to offer more surface to the cooling sides of the mold. The whole casting surface would be planed to make it smooth and exact in uniformity of the cross section. The top and bottom part of the mold would each be provided with a water jacket, cored into the casting, with staggered separating walls g (which would also stiffen the casting surfaces), and water inlet and outlet e. Both halves would be bolted together by a row of key-bolts on either side, which would allow of quick removal of the cover in case of irregularities, as freezing in or tearing apart of the billet. A mouthpiece for the liquid metal would have to be used similar to the one described above, or otherwise the inlet opening would have to be lined with refractory clay. Owing to the fact that generally sheets are rolled at lower speeds than rods or hoops, the length of this kind of mold would be considerably less than the one for rods or hoops. There is no doubt, however, that it will be far more difficult to keep a flat mold in good running order than a round one, especially if it be of small cross section.

When the device in Fig. 1 was shown to a number of interested parties several objections were raised. The most important was that it would be impossible to secure a uniform metal, and even if it were uniform, it would change its composition during the long time which would be required for the emptying of a furnace full of metal through such a small hole, or at such a slow rate of speed. It was further claimed that the mill has to stop at frequent intervals anyhow, to make adjustments, owing to the wearing out of the part of the rolls in use; that one never could test the physical or chemical qualities of the material till it was too late to correct them, that one could not gauge the thickness of the metal on the fly, that it could not be sheared quick enough; that the mold would burn out fast; that the bands

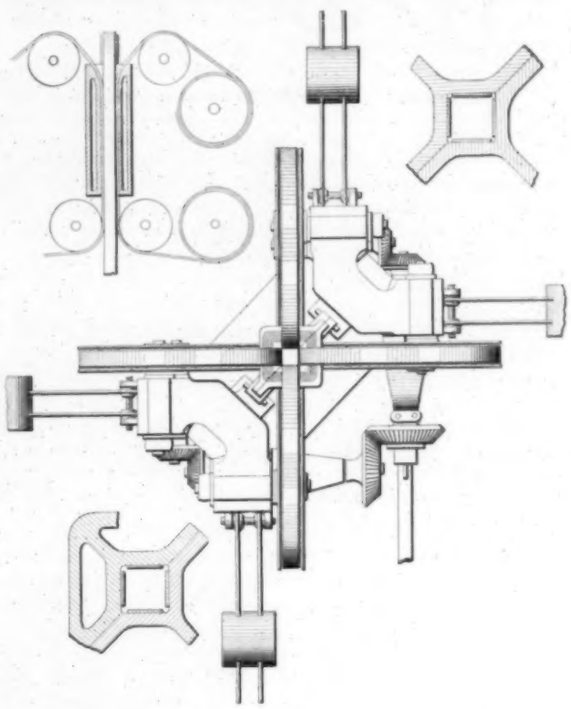


FIG. 7.—DETAILS OF THE F. W. WOOD PATENT.

thus rolled were not "worked" enough, and would therefore be brittle and weak, and so on. The surprising feature of all these predictions was that each critic had a new reason why the apparatus would not work, generally admitting that he did not think that the objections raised by the other parties would be worth considering, or at least could be overcome without much trouble. As far as the uniformity of the metal is concerned, the methods of steel making are sufficiently developed to make sure of keeping the proportions of the constituents for a long while within a very close limit; so close that no appreciable difference in the physical properties of the finished product will be found, at least none of such importance as to affect the commercial value of the product. In fact, any differences in the composition of the metal poured from the furnace proper into the reservoir could be, to some extent, regulated in the same, by making the required additions of materials in the way that is done now by the Talbot process. The choice of the means to secure the proper metal, the arrangement and construction of the furnaces and reservoir, would be the task for a professional and practical steel maker, and I limit myself merely to the remark that such sufficiently close regulation of the quality of the metal is possible at present. The objection that metal little "worked" necessarily reduces its strength or toughness has already been met with by Sir Henry Bessemer in an article read before the Iron and Steel Institute, October 7, 1891, in which he says among other things:

"When producing sheets of steel the initial thickness of which does not exceed 1-10 of an inch, it might at first appear that the finished plate, with only two more rollings might not get sufficient work done upon it to develop the same degree of toughness and cohesion that would be obtained by the many rollings which the present system necessarily involves, but a little consideration will render apparent the entirely different conditions under which the formation of the plates takes place.

"Mild cast steel is a crystalline substance, and follows the inevitable law of all crystalline bodies, in so far as the size of the crystals depends on the bulk of the mass and the time allowed for their formation. The longer the time allowed, and the greater the mass, the larger are the crystals obtained. Their planes of cleavage are also more clearly defined and are more easily separated from each other, or, in fact, have a less amount of cohesion."

A cast ingot of one foot square, quietly reposing in a soaking pit or heating furnace, may go on cystallizing for two or three hours, and develop a coarse crystalline structure; but in rolling fluid steel in the manner proposed, we have in place of a 10-inch ingot, a sheet of one-hundredth of that thickness only, and in lieu of the two or three hours allowed in ordinary cases for the formation of crystals, we have, when using a four-foot pair of rolls, making 4 revolutions per

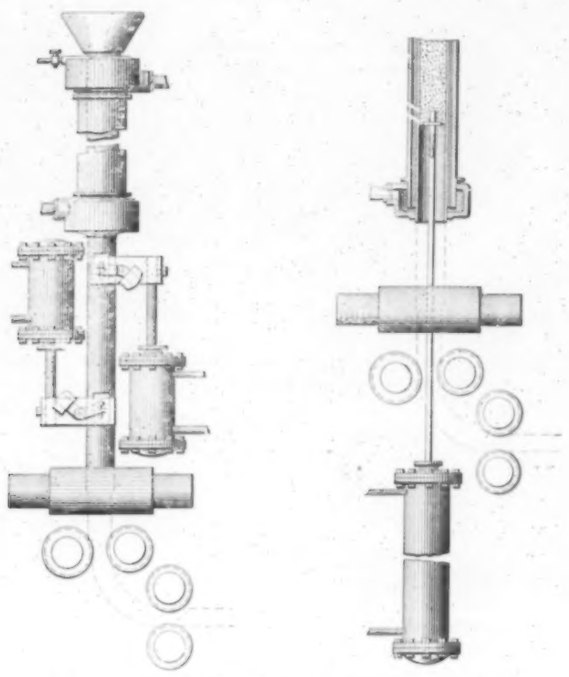


FIG. 8.—DIRECT PROCESS OF MANUFACTURING RODS.

minute, a transition from the absolute fluidity to absolute solidity, in just one-half of a second of time, in a mass of only one-tenth of an inch in thickness. If crystals are developed any period during the half second of time occupied by this transition, they must be microscopic indeed, and possess but little, if any, of the properties that are developed in large masses during hours of repose in the soaking pits. Hence it appears to me highly probable that the homogeneous fluid metal will pass at once into a perfectly homogeneous uncrystalline body, and being subjected to fluid, semi-fluid, and solid pressure in rapid succession, will develop the full cohesive force and toughness which the metal is susceptible of.

Quite a number of these attempts were directed towards the obtaining of large ingots, of a size, if not as large as the usual individually cast ingots, at least large enough to furnish billets for large sections of bars or beams, such as heavy structural shapes, railroad rails, and equivalent heavy squares and rounds, as for shafting, etc. Some of these propositions and suggestions bore the mark of impracticability on their very face. It certainly takes very little gift of prophecy to foretell the failure of the attempt, if ever the patentee put his idea to a practical test, to cast rails continuously in a mold of the exact cross sections of the rail, without rolling them. Even if the continuous mold for such a section could be made a success, which would be a rather difficult and expensive thing to do, at any rate, the physical properties of rails thus produced, would surely leave much to be desired for reasons stated below. One of the main troubles that would be encountered in the construction of a mold of large cross section is the fact that such a big ingot represents but little area in proportion to its volume, and therefore would cool but slowly. It takes about 10 to 12 minutes for a 12-inch ingot to cool sufficiently, from the time of pouring to the time of stripping the same. The continuous ingot should stand not less than the same time in the mold, to prevent bleeding when extracted. For even a moderate rate of production the mold would have to be inordinately long for convenient handling; the more, as the time required for cooling will probably increase in a faster proportion than the thickness of the ingot, and an initially cool mold will have probably a greater chilling effect than even a water-cooled surface continually exposed to an ever-changing current of hot metal.

Another just as important objection to the use of continuous molds of large cross section is the difficulty of keeping it tight, and the greater amount of damage which would be caused by an accident, as the breaking out of the liquid metal, or even an explosion, if any water from the jacket should happen to find its way into the mold proper.

The danger of the molding pipe being burned or melted by the liquid, and soldered to the solidifying metal seems very insignificant, provided the mold pipe is sufficiently thin to allow the water to exert its cooling effect without too much resistance through the walls. Water-cooled pipes, exposed to the most intense heat, struck directly by the flame, in melting and heating furnaces, were known to last for years, and to show no signs of wear by the hot steel continuously passing over them. It is also known that fluid steel will not adhere to steel surfaces polished and below red heat. Even if, after a long run, by some accident, as the cutting off of the cooling water to the jacket, or in case of breakage by mechanical force or shock, the device should happen to fail, the limited quantity of fluid metal at the spot, and the small streamlet which could escape from the furnace, would contain so small a quantity of heat, that their destructive possibility need not be seriously considered.

All the other objections raised, as the impossibility of testing the physical properties of the product, or of taking the gauge (measuring the thickness) and the difficulty of shearing and coiling are the same one has to contend with in any continuous mill running on billets.

While searching for precedents in construction or for patents on the subject, the writer found, as he had expected, that a large number of persons had worked on the same principle and had tried to develop it into something like a practical shape. Among these were men very prominent in the iron industry, and some of their early attempts were not surpassed by any subsequent effort, at least as far as actual constructions and appliances in use are concerned. We find among others the following:

As early as the year 1857 Sir Henry Bessemer tried to make sheets directly from the converter metal. It was intended to be only an experiment, and the apparatus used for the performance was the crudest possible. From 6 to 8 pounds of pig iron were melted in an ordinary crucible pot and completely decarbonized by blowing air through the metal. Then the pot had to be carried a considerable distance to a set of ordinary chilled 12-inch rolls, and the metal, still liquid, was poured between them. The rolls were set about 1-30 inch apart, and no provision had been made to confine the metal to a limited width between the rolls, but the width of the sheet varied according to the smaller or thicker stream of the molten metal, spreading more or less in the upper cavity or space between the rolls. According to the statement of Sir Henry Bessemer, the sheet thus produced had a clear surface, almost wholly free from oxidation, and absolutely free from scale. It was as tough as any rolled iron plate ever seen by him, and he had no doubt of the entire success of his system of rolling thin sheets direct from fluid metal. Sir Henry Bessemer, however, did nothing further in this matter at that time, as he was too busy with the development and perfection of the process of decarbonizing iron, which is now known as the Bessemer process. In a paper read before the Iron

and Steel Institute (Oct. 7, 1891), where he made the above announcements, he also gave his ideas as to how he would arrange the apparatus, in case he wanted to follow up the matter further, and he describes it as follows:

"The suggested improvements will be readily understood by reference to Figs. 4 and 5, and here I beg to observe that I have not gone into the many details necessary for the construction of rolling mills of this description, but have merely given such illustration of the general scope of my proposals as will enable them to be understood. The rolls L and M consist of two hollow drums through which a tubular steel axis NN passes, and conveys a plentiful supply of water for keeping the rolls cool. The brasses which support the roll M are fixed while those that support the roll L are movable in a suitable slide. The rolls, by preference, may be made 3 or 4 feet diameter, each having a flange on one end only, and thus form a trough with closed ends for containing the fluid metal. In order to obtain a regular and quiet supply of metal I employ a small iron box or reservoir lined with plumbago or fire clay. Along the bottom of this reservoir, some 10 or 20 small holes about 1-4 inch in diameter are neatly molded in a row by conical brass pegs. The reservoir should be well dried, and its interior surface heated to redness prior to its use. In this state the reservoir is to be placed in its proper position in the roll frame. A pair of rails Q are supported on the roll frames, and serve for the conveyance of the ladle R, which is mounted on wheels and brings the metal direct to the rolls. The ladle is provided with one or more stoppers or valves of the usual kind by means of which the supply of the metal to the reservoir may be easily regulated. The speed of the rolls also affords a means of regulating the quantity of metal required between them and an engine could easily be provided with differential speed gearing so as to instantly alter the speed of rolls to the very small amount ever required during the rolling process. The thin sheet of metal, as it emerges from the underside of the rolls is received between the curved guide plates S and T, to the latter of which the cutting blade U is bolted. Beneath the guide plate S a similar cutting blade is arranged to move suddenly forward by a cam and cut the thin sheet in two, the pieces so cut, afterwards falling between the second pair of rolls V, from which it again descends by gravity and passes the third pair of rolls W, and is delivered onto a horizontal table, or it may be allowed to slide down the inclined end of a cistern of water, moved slowly forward, and thus cool, and stack a ton of plates without any labor or trouble.

"The thickness of plates capable of being produced will much depend on the size of the rolls. If drums of 10 or 12 feet diameter are employed it is probable that plates of 3-4 inch in thickness could be produced or perhaps even thicker. The central space between drums of such large diameter would represent a sort of plate ingot mold with nearly parallel sides for some 8 or 10 inches in depth."

The apparatus thus described by Sir Henry Bessemer was never introduced into practical operation.

An apparatus patented by F. W. Wood is shown in Figs. 6 and 7. A square vertical sleeve, tapered at top and bottom, so as to form a hopper for pouring metal at the top, is held stationary, while four thin endless steel bands, held by their tension close to the sides of the sleeve, move downward in the mold, and return outside over band wheels to the top. The fluid metal is cooled by a water jacket, and when solidified will be taken along by the motion of the bands. Another engineer obtained a patent on a device similar in shape to a turntable along the rim of which are placed mold sections, forming together a complete circular open mold, with provisions for water-cooling. At one place the liquid metal is poured, which after becoming solid during a part of a revolution, is lifted continuously over the edge of the mold, and delivered into the rolls. Neither of these devices was practically tested.

A device similar to the one described and shown in Fig. 1 was patented by J. O. E. Trotz, and is illustrated in Fig. 8. A vertical mold pipe, jacketed and water-cooled, is provided with a hopper at the top for pouring the liquid metal, while a couple of cylinders are supposed to pull the ingot till it reaches the first set of rolls. It seems designed for large sections, but the chances of its success appear to lie in its application to small size rods.

Experiments similar to those made by Sir Henry Bessemer for producing sheets directly from the liquid metal between rolls were made in this country by E. Norton, in Chicago, but the writer could not learn of their success.

After an examination of all the devices, (not paying attention to designs evidently doomed by inherent and insurmountable difficulties) for continuously casting and rolling steel, it seems that all attempts up to the present to cast continuous ingots of large size have proven failures; that the method of casting sheets between rolls has so far not been successful, although the efforts in this line have a greater chance to succeed; while the field which offers the greatest probability for the ultimate success of continuous casting and rolling, the manufacture of light and easily rolled sections, such as wire rods, hoops, etc., has not been cultivated at all. It will be a paying investment for a manufacturer of these products to devote his attention to it and by comparatively inexpensive experiments to demonstrate not only the possibility, but also the superiority of this over the prevailing methods of manufacturing such light shapes.

OBITUARY.

Pierpont E. Dutcher, president of the J. A. & P. E. Dutcher Co., of Milwaukee, Wis., manufacturers of steel castings, died at his home at that place on Tuesday, March 11, in his 48th year. In 1882 he became associated with his father who was then the senior member of the Dutcher & Vose Stove Co. A few years later he purchased the interest of the junior partner and the firm name was changed to what it is at present. In 1889 it was decided to discontinue the casting of stove plate and the foundry was placed on steel castings.

Frank Conger, founder of the Groton, N. Y., plant of the American Bridge Co. and one of the vice-presidents of the combine, passed away at the Wayne Hotel in Detroit, Mich., on Saturday, March 8. He was 52 years old and was one of the best known financiers in the East. His remains were interred at his old home at Groton, N. Y.

William L. Elkins, Jr., died at his home near Philadelphia, Pa., on Thursday, March 13. He was a son of the traction owner, William L. Elkins, and was himself prominently identified with many business interests. He was about 38 years old. Mr. Elkins was president of the Pennsylvania Iron Works Co., the Otto Coke & Chemical Co., the Pittsburg Gas & Coke Co., the United Coke & Gas Co., the McKeesport Gas Improvement Co. and the New England Gas & Coke Co. He was also a director of the Allis-Chalmers Co.

Bryan Donkin died suddenly at the Grand Hotel, Brussels, March 3. He was born in 1835 and had an extensive practical experience as a manufacturer of machinery, though he was perhaps best known on this side of the Atlantic as an investigator in the scientific side of engine design. Early in the seventies he commenced a thorough treatment of efficiency tests upon engine and boiler capabilities and conducted these up to the time of his death. As an author he prepared the now standard work on "The Gas Engine" and later translated Diesel's book on "The Theory and Construction of the Rational Heat Motor." He compiled the reports of a most exhaustive series of boiler tests made with Prof. Kennedy on twenty-one different types and also made a lucid review of the scientific work of Hirn. He was a vice-president of the Institution of Mechanical Engineers, a Watt medalist, and Telford and Manby premium and prizeman of the Institution of Civil Engineers, a member of the Royal Institution, of the Société Industrielle de Mulhouse, of the Verein Deutscher Ingenieure and the American Society of Mechanical Engineers.

There will be no representation of the Chicago, Joliet and Milwaukee plants of the Illinois Steel Co. at the annual convention of the Amalgamated Association to be held in Wheeling beginning with April 15, for the reason that no lodges are in existence at these plants. One lodge at Milwaukee may be represented, but inasmuch as none of its members are employed in the Bay View plant it can hardly be said that the lodge is in existence. There is no truth in the report that the men in these plants will form a separate organization, despite reports to the contrary.

THE SIXTEEN-INCH BREECH-LOADING RIFLE.

BY WALDON FAWCETT.

The 16-inch breech-loading coast defense gun now in the final stages of completion at the Watervliet Arsenal, Watervliet, N. Y., conforms in many respects to the ordinary type of built-up ordnance. It consists of a long inner tube; a heavy jacket extending from the breech to a point about six feet beyond the trunnions; the chase hoops extending from the jacket to the muzzle and the jacket hoop enclosing the jacket and extending from the breech for about half the length of the gun. The gun is 49 feet 2.9 inches long; the diameter of the breech is 5 feet, of the muzzle 2 feet 4 inches, of the bore 16 inches. The total weight of the forgings of the gun as received from the steel works was 368,000 pounds, whereas the finished gun has a weight of approximately 300,000 pounds. The first steel castings for the gun arrived at the arsenal about five years ago, and the actual work of construction was begun about twelve months later. The rifle would have been completed early in 1901 had it not been for a flaw in the trunnion hoop. The condition of the steel was not discovered until after it had been shrunk on. An order was sent to the Bethlehem Steel Co. to cast a duplicate at once, but the turning of a hoop of this character to its proper size is necessarily a tedious operation.

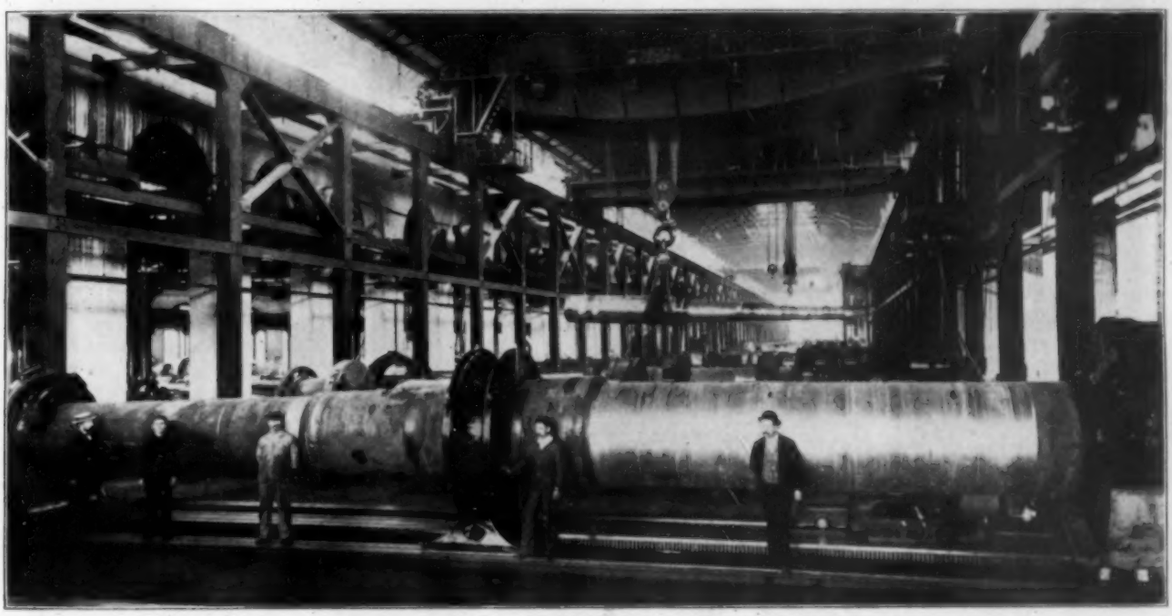


FIG. 1.—MAMMOTH POND BORING AND TURNING LATHES AT WATERVLIET ARSENAL.

At the time the 16-inch gun was designed it was expected by the Ordnance Department that a large number of guns of this character would be built and accordingly a sufficient number of machine tools were procured and installed at the Watervliet institution to meet any demand that might be made on the gun factory for this class of ordnance. This heavy and costly equipment and the mehods employed in handling the new rifle constitute perhaps the most interesting features in connection with the project. Among the machine tools are three boring and turning lathes designed at the Army Gun Factory and manufactured by the Pond Machine Tool Co., of New Jersey. These lathes are 138 feet in length with a swing of 9 feet, and each weighs 280 tons. The bed of each lathe was built in six separate sections. In addition the Pond company built from designs prepared at the Watervliet institution one turning and finishing lathe, one jacket lathe, one threading and slotting machine, one 60-inch hoop lathe, and two 84-inch hoop lathes. The Niles Tool Works, Hamilton, O., furnished one 18-inch slotting machine, one 72-inch vertical boring machine, and one horizontal boring, drilling and milling machine, all of commercial patterns, while the Morgan Engineering Co., Alliance, O., supplied the 150-ton electric traveling crane. The special tools for the boring of tube, jacket and hoops were manufactured at the Gun Factory.

The crane furnished by the Morgan Engineering Co. has a factor of safety of six, but this is reduced to five on account of the chain; it will, however, carry 120 tons with this large safety factor. The chain originally designed for the crane, but not furnished, would have provided for the handling of 150 tons with a safety factor somewhat greater than that specified. The crane is equipped with one Thomson & Houston shunt-wound motor, originally wound for 500 volts. After the crane was installed the motor was changed to 220 volts. The motor runs at a speed of about 1,000 revolutions a minute, requiring about 80 amperes when under full load. The different movements of the crane are controlled by shafting geared to motor, one motor doing all the work. The power to operate the motor is taken from six single wires lying alongside and on each side of the crane track, being stretched and held in place by long composition rods, threaded on one end, fastened to each wire and set up with nuts on each end of wire.

Also utilized in the handling of the material for the 16-inch rifle was the 60-ton electric crane manufactured by the Shaw Electric Crane Co., of Muskegon, Mich. This is provided with four series motors, one for each movement. The main hoist motor is a 75-horsepower motor of the multipolar type. The brake is automatic in operation; that is, when current enough to lift the brake has been applied the brake is released and the motor starts to lower or hoist as the case may be. The auxiliary motor is rated at 20-horsepower at about 250 revolutions. The brake on this hoist is of the same general design and is connected and works in the same manner as the brake on the main hoist. The trolley motor, the function of which is to move the car on the crane is rated at 9½-horsepower at about 300 revolutions per minute. It is of the same design as the auxiliary hoist and bridge motors. The bridge motor is rated at 20-horsepower at about 250 revolutions. There are four starting boxes located in the cage of the crane and operated by levers in the hands of the operator.

The turning and boring lathes constitute, of course, the most interesting feature of the machine tool equipment. Each lathe consists of bed, headstock, two tool carriages, muzzle, intermediate and breech back rests and boring bar with carriage. The bed is composed as follows: The headstock end 23 feet 4 inches by 9 feet 10 inches wide, a single casting; the remainder of the main bed in two sections, each a single casting 22 feet 4 inches long and 9 feet 10 inches wide; the boring-bar carriage bed in three sections each a single casting 22 feet 4 inches long and 6 feet wide. The total length of the bed is thus 135 feet. All sections of the bed are held together by means of taper bolts. The headstock carries three spindles—main, cone and back-gear. The front end of the main spindle carries the face plate 9 feet 2 inches in diameter and with eight chuck jaws of cast steel taking in diameters between limits of 18 and 67 inches.

The tool carriages of which there are two, consist of the lower, lateral slide capable of traveling the length of the main bed by means of a feed screw or ratchet wrench; on this slide, the lower cross slide; on the lower cross slide, the swivel slide; on the swivel, the intermediate cross slide, and on the intermediate cross slide, the two upper cross slides, with which the turning tools are fastened in. The feeds to operate these rests are taken from the back-gear spindle, through change gears to lead screw and spline rod, which rod engages with lower lateral slide by means of bevel gears. There are three back rests. Two of these are ring rests, one being used at the center of the gun and the other at the muzzle. The third rest is a dead rest and is used at the breech end of the gun after the gun is fully assembled. The boring bar is

over its entire length including the extra length for testing. After treatment to give it the necessary physical qualities four specimens were cut from each end of the tube and showed physical qualities as follows: Elastic limit, 51,375 pounds per square inch; tensile strength, 84,350 pounds per square inch; elongation, 20.38 per cent, and contraction, 41.93 per cent.

The ingot used for the jacket was also of nickel steel, octagon in section and weighed about 245,000 pounds, being cast from the product of three open-hearth furnaces. The physical qualities as represented by an average of eight specimens cut from the prolongation of the jacket are: Elastic limit, 52,250 pounds per square inch; tensile strength, 87,800 pounds per square inch; elongation, 22.16 per cent, and contraction, 48.32 per cent. The hoops were made of simple fluid-com-

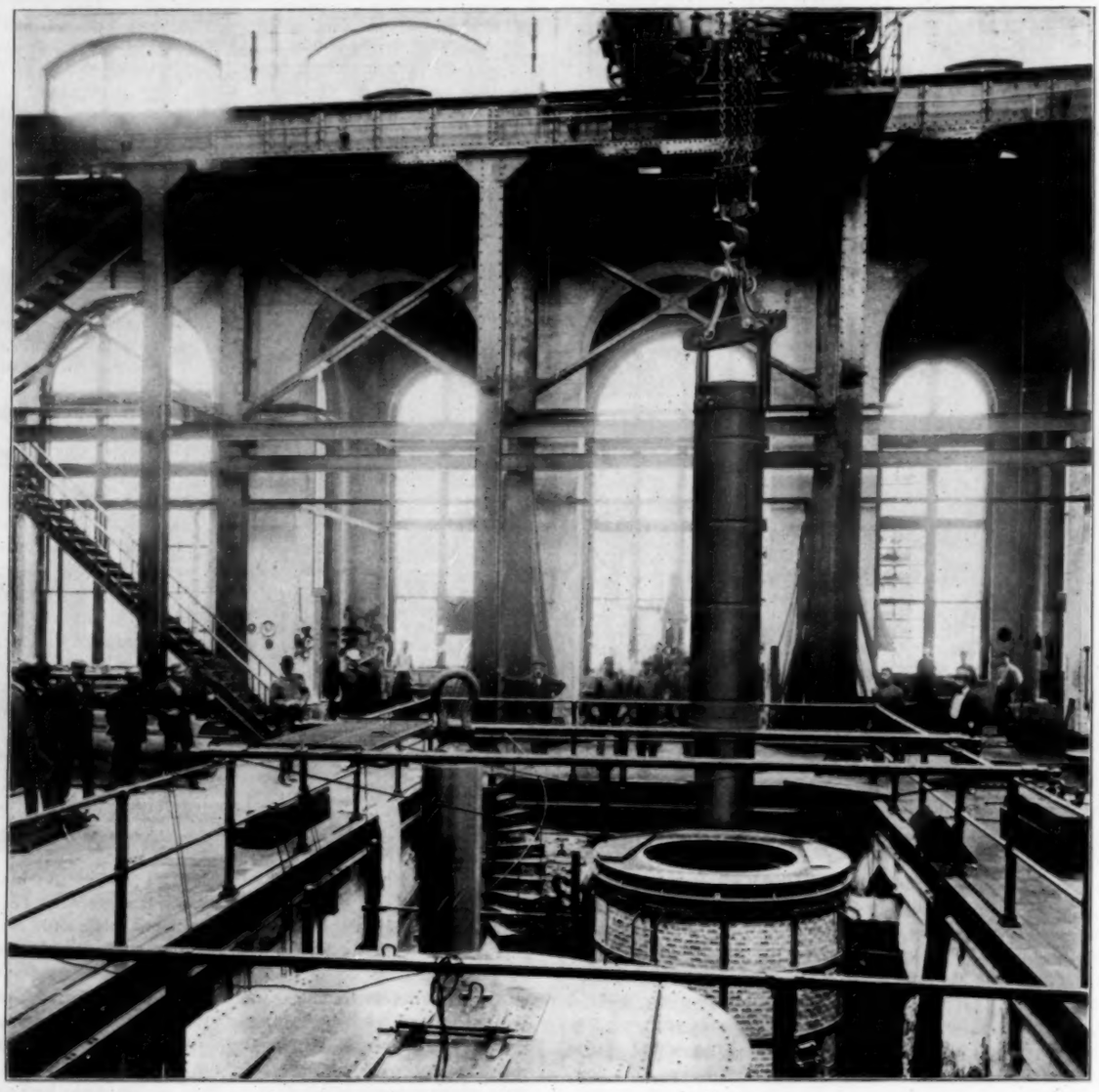


FIG 2.—SIXTY-TON ELECTRIC CRANE LOWERING PORTION OF 16-INCH GUN INTO SHRINKAGE FURNACE AT WATERVLIET ARSENAL.

of forged steel 61 feet long by 11 inches in diameter, with a 7-inch hole extending its entire length. It is made in two pieces coupled together securely.

The tube of the 16-inch rifle was made from a nickel-steel ingot, octagon in section, weighing about 100 tons. The ingot was cast from the product of three open-hearth furnaces. A discard of about 44 tons was cut from the top of the ingot and about 8 tons from the bottom of the ingot, leaving a block 188 inches long, octagonal in section, which was used to make the tube forging. A hole was bored longitudinally through the axis of this block after which the block weighed about 50 tons. From this block the tube was forged hollow on a mandrel under a 14,000 hydraulic press, the forging being of sufficient total length to provide the necessary test material. In the machine shop the forging was rough-turned and bored

pressed steel, containing no nickel. The ingots were cast round in section and were cut in a lathe transversely into blocks of suitable weight to make the hoops, together with extra metal for testing. The hoops were made of harder steel than the tubes and jackets, the physical qualities being as follows: Elastic limit, 57,125 pounds per square inch; tensile strength, 107,050 pounds per square inch; elongation, 19.28 per cent, and contraction, 45.52 per cent.

The operations in connection with the manufacture of the 16-inch rifle called into requisition for the first time the new oil-burning high-pressure stream shrinkage furnace at the Watervliet Arsenal. The furnace consists of a vertical, cylindrical 13-inch fire brick wall resting upon solid rock in the corner of the shrinkage pit. Being upon the 30-foot level and 27 feet 9 inches high its top is 2 feet 3 inches below the floor

level. Fuel oil is supplied through a 3-inch pipe from a 5,000-gallon tank and enters the furnace through twenty burner openings in five tiers of four burners each. In order to handle the great weight represented by the 16-inch gun the crane-way in the gun shop was strengthened in a most thorough manner. For one thing a system of horizontal and diagonal bracing was introduced, the horizontal braces being continuous and the diagonal bracing alternating in the different bays of the building. It was desired to strengthen the crane rails by providing a rolled solid form of rail, but it was found that this could not be obtained from the steel works without new rolls were made, and it was decided therefore to order steel castings. The new rails are 16 inches in width at the base and show a tensile strength of 75,000 pounds per square inch.

The crane attachment for the transportation of the 16-inch gun to and from the various lathes and machines provides for the suspension of the gun by four steel-wire slings, each pair of slings being attached by heavy hooks to the end of beams pivoted in the middle on pins and secured to the lower corners of a triangular frame. This triangular frame is suspended at its upper corner by a bail which goes through the main hoisting eye of the crane.

OUTPUT OF BESSEMER INGOTS AND RAILS IN 1901.

The American Iron and Steel Association has just published complete statistics, received from manufacturers, of the production of Bessemer steel ingots and castings in the United States in 1901; also of the production of Bessemer steel rails by the producers of Bessemer ingots. The ingot statistics include a few thousand tons of Bessemer steel castings. We reproduce the summation of the returns below:

INGOTS.—The total production of Bessemer steel ingots in 1901 was 8,713,302 gross tons, against 6,684,770 tons in 1900, showing an increase in 1901 of 2,028,532 tons, over 30 per cent. The production of 1901 was by far the largest in our history. The following table gives our production of Bessemer steel ingots and steel castings in the last six years, including the production of the Robert-Bessemer and Tropenas works. Of the production last year 6,764 tons were steel castings, against a similar production in 1900 of 6,467 tons.

Years. Gross tons.	Bessemer ingots.	Years. Gross tons.	Bessemer ingots.
1896	3,919,906	1899	7,586,354
1897	5,475,315	1900	6,684,770
1898	6,609,017	1901	8,713,302

Below we give by States the production of Bessemer steel ingots in the last four years.

States—Ingots.	1898. Gross tons.	1899. Gross tons.	1900. Gross tons.	1901. Gross tons.
Pennsylvania	3,402,254	3,968,779	3,488,731	4,293,439
Ohio	1,489,115	1,679,237	1,388,124	2,154,846
Illinois	1,105,040	1,211,246	1,115,571	1,324,217
Other States	612,608	727,092	692,344	940,800
Total	6,609,017	7,586,354	6,684,770	8,713,302

There were no Clapp-Griffiths works in operation in 1901 and only two Robert-Bessemer plants were active. Seven Tropenas plants were at work, the same number as in 1900. All the Robert Bessemer and Tropenas plants employed in the production of steel castings.

RAILS.—The production of all kinds of Bessemer steel rails by the producers of Bessemer steel ingots in 1901 was 2,836,273 gross tons, against a similar production in 1900 or 2,361,921 tons and of 2,240,767 tons in 1899. The maximum production of Bessemer steel rails by the producers of Bessemer steel ingots was reached in 1901. The year of next largest production was 1900, which was closely followed by its predecessor, 1899. In 1887, fourteen years ago, 2,044,819 tons were made. This was the fourth year of largest production. The following table shows the production by States of Bessemer steel rails by the producers of Bessemer steel ingots in the last four years. The figures given do not include a small quantity of rails made each year from purchased blooms or from rerolled steel rails, statistics for both of which products for 1901 are not yet available.

States—Rails.	1898. Gross tons.	1899. Gross tons.	1900. Gross tons.	1901. Gross tons.
Pennsylvania	1,052,771	1,224,807	1,195,255	1,406,008
Other States	902,656	1,015,960	1,166,666	1,430,265
Total	1,955,427	2,240,767	2,361,921	2,836,273

At the request of the manufacturers the association separated for 1897, for the first time, the production of Bessemer steel rails weighing 45 pounds and less than 85 pounds to the yard from those weighing less than 45 pounds and over 85 pounds. This separation is continued for 1901 as follows:

States—Rails.	Under 45 pounds. Gross tons.	45 pounds and less than 85. Gross tons.	85 pounds and over. Gross tons.	Total Gross tons.
Pennsylvania	80,001	1,095,279	230,728	1,406,008
Other States	60,213	1,106,958	263,094	1,430,265
Total for 1901	140,214	2,202,237	493,822	2,836,273
Total for 1900	154,796	1,605,067	602,058	2,361,921

It will be noticed that there was a considerable decline in 1901 in the production of steel rails weighing 85 pounds and over as compared with 1900. The total production of rails in 1901 will include rails made from open-hearth steel and iron rails. When all the figures are collected, General Manager Swank estimates that it will be found that our total production of all kinds of rails in 1901 was about 2,875,000 tons. Great Britain's largest annual production of Bessemer steel rails was in 1882, when she made 1,235,785 tons.

Railroad Demand to be Still Abundant.

The condition of order books of car and locomotive works and a practical certainty that a portion of the rail business now under contract for 1902 will be carried over to 1903, point to a continuance of heavy demand from railroads beyond the present year. At the meeting last week of the directors of the Pennsylvania Railroad Co. they approved of the issue of $50,000,000 3½ per cent gold bonds. Of this amount $25,000,000 is to be used for purchasing 19,000 fifty-ton steel cars and 260 locomotives, $20,000,000 for real estate and construction of the New York tunnel and terminal during the next two years and $5,000,000 for general corporate purposes. If average crops are gathered this year it would seem that railroad buying will continue for months to be a large factor in the iron trade.

The Ohio works of the National Steel Co., at Youngstown, O., will resume rolling rails within a few weeks. The hot-bed engines were taken out some time ago when the mill went on billets, and these are now being replaced. Owing to the demand for rails it is altogether probable that this mill will continue on standard sections instead of billets throughout the remainder of the year.

The Youngstown Engineering Co., Youngstown, O., last week shipped its first crane. It has a capacity of 15 tons and will be installed in the plant of the Youngstown Foundry & Machine Co. The company was recently incorporated with $50,000 capital. The officers of the company are John Runnette, president; B. F. Boyd, vice-president; H. A. Boyd, secretary and treasurer, and James Farrington, general superintendent.

The Gobeille Pattern Co., Cleveland, Jos. Leon Gobeille, president, announces that Chas. H. Meigs, for some time secretary of the company, is no longer connected with it in any capacity.

The British Seamship Myrtledene has arrived at Philadelphia, Pa., from Middlesbrough, England, laden with 3,000 tons of pig iron for Philadelphia foundrymen. This is the first shipment on an order of 9,000 tons recently placed.

PERSONAL.

Aaron French, head of the Steel Spring Co. of America, is lying critically ill at his home in Pittsburg. Three weeks ago he suffered two paralytic strokes while at Atlanta, Ga., and he was immediately brought home. Hopes for his recovery are now entertained.

P. R. Ramp, who has been manager of the C. B. & Q. Foundry of Aurora, Ill., has resigned his position to become superintendent of the foundry of the American Locomotive Co.'s plant at Schenectady, N. Y.

J. H. Orwig has resigned as manager of the plant of the Niles Boiler Works, Niles, O. He will probably be succeeded by E. A. Gilbert.

At a meeting of the stockholders of the Union Switch & Signal Co., held at Pittsburg last week, directors for the ensuing year were elected as follows: George Westinghouse, G. C. Smith, Robert Pitcairn, J. H. Willock, William McConway, Thomas Rodd and Frank Moore.

Thomas A. Beattie, for the past four years superintendent of the Boston Iron & Steel Works of the National Tube Co. at McKeesport, Pa., has resigned from that position to accept the superintendency of the Riverside mills at Wheeling, W. Va. William K. Herwig has been appointed Mr. Beattie's successor.

At a special meeting of the board of directors of the Sharon Steel Co., held last week, Thomas A. Harris was elected secretary, to succeed Mr. Delameter, who recently resigned. Mr. Harris was formerly secretary of the Sharon Tin Plate Co. and later assistant treasurer of the Sharon Steel Co.

Wm. Kinross has been appointed superintendent of the Iowa Iron Works, Dubuque, Ia., to succeed the late Wm. Hopkins.

Arthur O'Brien, for several years connected with the Elwood, Ind., plant of the American Tin Plate Co., has been appointed assistant manager of the Monessen, Pa., plant of the company.

F. O. Bunnell, formerly connected with Robert W. Hunt & Co. of Chicago, has been appointed chief chemist of the Chicago, Rock Island & Pacific Railway, with headquarters at the company's shops at 47th and Wentworth avenue, Chicago, to succeed C. F. Drake, who has accepted a position as mechanical engineer with the Sargent Co. of Chicago. Mr. Bunnell will be assisted by George H. Green.

Chas. Aland has resigned as superintendent of the New York Central Foundry at Frankfort to become superintendent of the pipe foundry of James B. Clow & Sons, Newcomerstown, O.

S. M. Rodgers, for several years chief chemist at the Newburg works of the American Steel & Wire Co., Cleveland, is now connected in the same capacity with the Worcester, Mass., works of the company.

F. H. Miller, second vice-president and sales manager of the Columbus Iron & Steel Co., Columbus, O., has been confined to his home at Columbus, O., for the past week on account of illness and his condition is now considered quite serious.

The coroner's jury has exonerated the Penberthy Injector Co., of Detroit, and the engineer from responsibility for the boiler explosion at the company's plant on Nov. 26, 1901, which caused the death of 30 persons. The Penberthy Co. is re-established in business and working full force, but on account of the unprecedented demand for injectors night and day shifts are to be put on.

The Tindel-Morris Co., Frankford, Pa., in the near future will remove its forking plan to Eddystone, Pa. The new buildings are now being hurried to completion.

The Pennsylvania Engineering Works, New Castle, Pa., will greatly enlarge and extend its plant with the capital recently provided by the increase in capital stock to $500,000. The buildings to be erected include a boiler shop, machine shop and electric light plant. The machine shop will be 150 feet long and 84 feet wide, and will be equipped with the most modern machinery obtainable. The boiler shop will be 300 feet long and 65 feet wide. It will be equipped with an electric traveling crane running the entire length of the building. An electric power plant costing about $50,000 will also be erected. The contract for erecting the buildings has been awarded to the Fort Pitt Bridge Co., of Pittsburg.

TRADE PUBLICATIONS.

Catalogues 40 and 41 have been received from the Stilwell-Bierce & Smith-Vaile Co., Dayton, O. No. 40 illustrates Smith-Vaile power pumping machinery, more especially the triplex type, and no attempt has been made to catalogue all the designs made, but to restrict the enumeration to those styles that are in most demand for ordinary service. Even with this limitation the catalogue extends to 96 pages 6x9 inches. No. 41 covers some 72 pages of the same size and treats of special machinery for heating and purifying feed water for steam boilers. A large number of testimonials are printed in facsimile testifying to the merit of these appliances.

A 20-page catalogue of the J. G. Alexander Mfg. Co., of Grand Rapids, Mich., is devoted to draughting room furniture. The company manufactures the Fry patent adjustable draughting table, folding drawing tables and mechanical training school tables. The Fry draughting tables have frames of cast iron with black enamel finish and bronze trimmings. There are no springs or set screws. The top can be adjusted to any angle without stopping or moving from the seat. The sizes are from 32x42 inches to 48x120 inches. The pamphlet gives illustrations of all the tables and their attachments.

The E. Keeler Co., of Williamsport, Pa., has prepared a small pamphlet descriptive of that type of water-tube boiler designed by this company. They are built for various pressures, different fuels or any specified duty and comprise the well-known features of modern practice with several novel departures. The tubes and headers, hand holes, circulation, grates, feed, support and setting together with the all-important question of combustion, are given treatment in separate but necessarily brief paragraphs.

The American Manufacturing Co. is sending out a "Little Blue Book on Rope Transmission." This is the third edition published by this company on rope transmission, and is something more than the average trade publication. It aims at conveying more than the complimentary description of a manufacturer's product, and this merit will make it last longer with a much more effective advertising force than many efforts that are destined to feed the waste-paper basket. This little book will be sent on application to the American Manufacturing Co., 65 Wall street, New York.

Catalogue No. 21, containing 294 pages, has been sent out by the Deming Co., manufacturers of pumps and hydraulic machinery, Salem, O. It contains very full descriptions of the varied line manufactured by the Deming Co., and gives useful tables and other data for the calculation of pump capacity and power. A spray pump catalogue and a power pump pamphlet are also received detailing the peculiarities and merits of these goods. Several power pumps of later design are shown in the new large catalogue.

The 1902 catalogue of the Keystone Mineral Prospecting machines contains some 48 8½x12-inch pages. It is issued by the Keystone Driller Co., Beaver Falls, Pa., and is an excellent piece of work. These machines are made for exploring and assaying placer mines and exploring for coal, lead, zinc, iron, etc., making soundings for bridge piers, foundations, etc. The why and wherefore of the construction and design of the whole arrangement from drill to machine is elaborated in painstaking style.

The National Oil Burner & Equipment Co., St. Louis, Mo., has published a pamphlet descriptive of tests in the use of fuel oil in furnaces using this make of burners and system of feeding the oil to boiler. The tests extended over a period of sixty days and were made at the plant of the Carleton building in St. Louis.

We have received some advance pages from the forthcoming catalogue of the Marine Iron Works, Chicago. There are given some interesting data concerning this make of engines, boilers and boats.

The ninth edition of catalogue No. 7 is descriptive of the perforated metals manufactured by the Allis-Chalmers Co., Chicago. The book contains 48 pages, is well illustrated and has tables of the weight per square foot of different sheet metals, for punching steel plates, different wire gauges in comparison, etc.

The Modern Iron Works, of Quincy, Ill., has an order for 13 large syphons from Calcutta, India.

CLEVELAND MOLDERS' STRIKE SETTLED.

As stated in these columns last week, the machinery molders employed by twelve foundry concerns in Cleveland went on strike Wednesday, March 12. The following concerns were affected: American Shipbuilding Co. (2 shops), Bowler Foundry Co., City Foundry Co., Cleveland Steel Cast Co., Chisholm & Moore Manufacturing Co., Fulton Foundry Co., Kilby Mfg. Co., (2 shops), Macbeth Iron Co., Maher Wheel & Foundry Co., Patterson Foundry Co., Riverside Foundry Co., and East End Foundry Co.

On February 3 the local unions made a demand for an advance of 25 cents on the minimum paid to both bench and floor molders, increasing it from $2.75 to $3. For several years there has been no differential between the two classes in Cleveland. To this letter the Cleveland Founders' Association replied that its members did not feel that there was any just reason why they should be called upon to pay a rate so much in excess of that paid in any other city of Cleveland's class; that they felt they should be accorded the privilege of establishing a differential in the minimum, and in any event they wished to protest against the principle of a minimum wage rate, as at present understood.

A conference followed, but without agreement. Then came the conference of the National bodies and a second failure to agree. The National Founders' Association conferees first offered the same basis now existing in Chicago, Cincinnati, Detroit, Indianapolis and St. Louis, and later, in view of the fact that a differential did not exist in Cleveland, offered a flat rate of $2.85. The action of the Cleveland molders was then sanctioned by their National officers and the strike was called, the men going out Wednesday morning. On Friday a second local conference was arranged for and committees appointed with full power, indicating a willingness on both sides to make some concession. The conferees met on Saturday morning, March 15. The molders were represented by their entire executive committee—one man from each shop on strike—15 in all, as well as their local officers, and Jos. F. Valentine, first vice-president of the union, although but five of the men had power to vote and discuss matters brought before the conference. The foundrymen were represented by W. W. Balkwill, of the Cleveland Steel Casting Co., president of the Cleveland Founders' Association; W. C. Bruce, of the Bowler Foundry Co.; Jas. J. Lonergan, of the City Foundry Co.; D. J. Kilby, of the Kilby Manufacturing Co., and Geo. Vaillant, of the Fulton Foundry Co. John A. Penton, of the National Founders' Association, was also present.

The molders opened the conference by offering a resolution to the effect that a general advance all along the line of 15 cents per day be granted, to take effect on March 17, and continue until May 1, when a further general advance of 10 cents per day be given, which should hold good for the following twelve months. This was lost, as it would cost the foundrymen of Cleveland about twice as much in the course of a year as the original demand for a $3 minimum.

After the molders had made another proposition, which was lost by a tie vote, asking for a 15-cent general advance at the present time, to hold good until June 30 next, when the minimum should be advanced to $3 per day, this to continue for one year thereafter, Mr. Penton addressed the conference. He explained that of the 400 men on strike, but 42 were bench molders. Of the total number of men out, but 61 per cent were working at the minimum, and of the floor molders alone 50 per cent were now getting better than $2.75. He explained that the great majority of the men were really working under a great disadvantage when they tried to keep the bench molders' minimum at the same point as their own, and on behalf of the foundrymen he offered any one of the following propositions: To make the minimum for bench men $2.85 and the minimum for floor molders $2.90, which would mean an increase to all the molders for the year of $10,965; or by taking five cents from the bench men and adding it to the floor minimum, making the rates $2.80 and $2.95 respectively, the molders in Cleveland would receive a total increase of $13,950 for the ensuing year; or, the foundrymen would go still further, making the bench minimum $2.75, and the floor rate $3, which would make the increased earnings of the men as a whole, $16,935 for the coming year.

The conference then took a recess, and upon coming to order the molders stated that there was no need of discussing further the matter of a differential—that their hands were tied in that respect. They then asked for a straight 15-cent advance all around to take effect March 17, and continue for one year. An amendment was offered by the foundrymen to establish the minimum at $2.90 per day, and to give all men now receiving better than $2.75, an advance of 10 cents per day, which amendment, however, was withdrawn after some discussion. The original proposition was then put to vote, and was carried unanimously. The following agreement was drawn up and signed by the representatives of both sides:

"AGREEMENT, made this fifteenth day of March, 1902, between the members of the Cleveland Founders' Association, who are members of the National Founders' Association, and Local Unions Nos. 218 and 311, members of the Iron Molders' Union of North America, witnesseth:

"That the members of the National Founders' Association, located in the city of Cleveland, O., whose foundries have been involved in a demand for an increase in wages on the part of their molders at the time this agreement was signed shall on and after this date, pay to their molders a rate of wages in harmony with the following schedule:

"The minimum rate of wages on and after this date shall be $2.90 per day of ten hours.

"The molders involved in this controversy shall be paid an increase of 15 cents per day upon the rate paid to them on Tuesday, March 11, 1902.

"That time and one-half shall be paid for all overtime, and double time for Sundays and legal holidays, to-wit: Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

"That the conditions existing regarding hours of work in the foundries in the city of Cleveland, O., shall be the same during the ensuing year as for the year just past.

"That it is hereby mutually agreed and understood that in case of any arrangement being made by the officers of the International Iron Molders' Union of North America and the National Founders' Association, having any reference to the question of differentials now under consideration by the officers of either association, it shall be made a part of this agreement, and that all parties hereto shall be bound by any National agreement that may be made or entered into between the representatives of both associations at any time during the life of this agreement.

"That this agreement shall be in force and effect for one year from March 17, 1902. Should either party desire to change any of the provisions of this agreement, not hereinbefore provided for, 30 days' notice prior to its expiration shall be given. If no notice is given by either party, this agreement is to be in effect for the next following year, and so on."

The Cincinnati Milling Machine Co., Cincinnati, O., has just issued its catalogue for 1902 showing its new line of milling machines. It is a handsome piece of book-work with illustrations in half-tone throughout. A number of improvements are illustrated and described in detail; among these, the new all-gear feed, whereby all feed changes are instantly obtained by the movement of a lever, the drive being always positive, permitting heavier and faster cuts than belt-fed mechanism.

A. Leschen & Sons Rope Co., St. Louis, Mo., has received a contract for the machinery for an aerial wire-rope tramway, connecting the Ferris-Haggerty group of mines with the Boston-Wyoming Smelter, at Grand Encampment, Wyo. The tramway to be installed is the Leschen Co.'s patent, which operates automatically in receiving and discharging. It will be 16 miles in length—the longest aerial tramway yet constructed. Numerous tramways of the Leschen company's patent are in use in the mining regions.

The Avery Manufacturing Co., Peoria, Ill., shipped to Constantinople, Turkey, several days ago, one of the largest consignments of threshing machinery that has left its works. It consisted of eight complete threshing outfits, including engines, separators, tanks, self-feeders, stackers, etc.

The Iroquois Machine Co., besides acquiring the plant of the Universal Machine Co., at Providence, R. I., and leasing an adjoining plant, has secured additional factory space in another part of the city, so that its plans can be carried out on the scale originally proposed.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

The Standard Bolt & Mfg. Co., of Alliance, O., recently incorporated, will manufacture bolts, nuts, rivets and forgings. The buildings, for which plans have been made, will be of brick, with slate roof—the main building 70x208 feet, and the boiler house 34x34 feet. The officers of the company are: W. K. Fogg, president; P. M. Haas, vice-president, and E. E. Scranton, secretary and treasurer.

P. Delaire, 48 Rue de Malte, Paris, France, has written for catalogues of automatically grinding, sharpening and buffing machines for knives.

The Insurance Stove, Range & Foundry Co., Covington, Ky., has been incorporated with an authorized capital of $20,000 by H. H. Uckotter, of Cincinnati, O., and F. Breiner, F. Eltrup, George Uckotter and Frank Uckotter, of Covington.

The Riverside Bridge Co., Wheeling, W. Va., has been incorporated with a capital stock of $200,000 by Nelson E. Whitaker, Henry Schmulbach, F. J. Park and others.

The Elizabeth Iron Co. of Duluth, Minn., has been incorporated with $50,000 capital.

The Craig Shipbuilding Co. of New Jersey has been organized and has taken over the property of the Toledo, O., Drydock Co. and the Craig Shipbuilding Co. The new company has a capitalization of $1,250,000. It is equally divided between common and preferred. Bonds in the sum of $150,000 have been executed and are secured by a trust deed covering the entire property. The new officers of the company are as follows: John Craig, president; E. W. Tollerton, vice-president; John F. Craig, treasurer, and A. H. Merrell, secretary. George Craig has been appointed general manager.

The Hofeller Brass Foundry Co. of Buffalo, N. Y., has been incorporated with $6,000 capital. T. Hofeller, J. Hofeller and C. P. Moffett are the incorporators.

The Diven-Dived Foundry Co., of Baltimore, Md., has been incorporated with $50,000 capital to operate an iron foundry. G. L. Dived, James Bartol, C. B. Kranz, J. W. Diven and T. M. Diven are the incorporators.

The Huxley Valve Manufacturing Co. of Louisville, Ky., has been incorporated with $15,000 capital to manufacture a new type of valve. F. Wahl, C. E. Huxley and T. L. Jefferson are the incorporators.

The C. O. Bartlett & Snow Co. of Cleveland, O., has been organized with $60,000 capital for manufacturing hoisting and drying machinery, boilers and engines. K. F. Snow, C. O. Bartlett, I. M. Snow, Jacob Hajek and M. B. Tappe are the incorporators.

The Arnold-Creager Co. of Cincinnati, has been incorporated at Dover, Del., and will manufacture machinery. Capital stock, $100,000.

The General Metal Rolling Machine & Manufacturing Co., of Newark, N. J., has been incorporated with a capital of $125,000. Incorporators: Warren Clouse, John R. Taylor and John H. Lotsch.

The Robinson Sewing Machine Co., of Jersey City, N. J., has received a charter of incorporation and will manufacture sewing machine attachments. Capital, $100,000. Incorporators: Richard Dougherty, John S. Brown, Georgianna Robinson and Alex. Cristadors.

The Velox Machine Works, Chicago, has been incorporated with a capital stock of $50,000. The incorporators are Charles H. Ferguson, John M. Southworth and George S. Webb.

The Lufkin Foundry & Machine Co., Lufkin, Tex., has been incorporated with a capital stock of $30,000, by S. W. Henderson, J. H. Kurth, F. Kavanaugh, Jr., and others.

A foundry is to be built by Hancock capitalists at Ripley, Wis. Robert Williams, a machinist in the employ of the Hodge foundry, is said to be behind the project.

The Caldwell Furnace Foundry Co. of Toledo, O., has been incorporated in New Jersey with $300,000 capital. The company has purchased a foundry at Fort Payne, Ala.

The Hibben-Hill Boiler Works of Chicago, Ill., has been incorporated by George Hibben, H. K. Hibben and James C. Hill, with $12,000 capital.

A car-building plant is to be located in the Birmingham, Ala., district. The Commercial Club will secure for Pennsylvania capitalists a site, 400x400 feet for the plant and 50 residence lots for the employes. The factory will cost $50,000 and employ several hundred hands.

The Chappell Furnace Co. has been organized at Morenci, near Grand Rapids, Mich. The capital stock is $15,000. The Lee Baker foundry has been purchased and it will be enlarged and newly equipped.

The Spuck Iron Co. has been incorporated at St. Louis, Mo. Capital stock, $75,000, paid. John Spuck has 610 shares, Louis Somerhauser 60 shares, Frederick A. Meyer 40 shares, and Julius E. Volmer and William Geyer each have 20 shares.

The Western Tool Co. of Lansing, Mich., has been incorporated with $10,000 capital to develop the business of A. T. Van Dervoort. This company will act in the capacity of selling agents for a large number of machine tool concerns. H. H. Larned, J. E. Roe, J. P. Edmonds, O. A. Jenison, H. E. Thomas, R. Y. Larned and A. T. Van Dervoort are the incorporators.

The Buckeye Engine Co. of Salem, O., has been incorporated with $1,000,000 capital under the laws of the State of New Jersey. The plant and business of the Buckeye engine company will be taken over.

The Shaw-Gerlinger Steel Casting Co. of West Allis, Wis., has been incorporated with $7,000 capital by E. C. Shaw, William Gerlinger and C. A. Gerlinger.

The Missouri Sheet Iron Works Co. of St. Louis, Mo., has been incorporated with $20,000 capital to operate a stamping plant. E. N. Tolkacz, M. Tolkacz and M. Thiet, are the incorporators.

The Chicago Furnace Supply Co. of Chicago, has been incorporated with $15,000 capital to manufacture articles from iron, tin and sheet metal. F. W. Metz, A. E. Williams and D. A. Colbert are the incorporators.

The Cleveland Automatic Molding Machine Co. has been incorporated with $10,000 capital. George F. Knash, L. A. Ritzman, J. W. Butterfield, J. W. Burrell and W. E. Patterson are the incorporators.

The Bakersfield Iron Works of San Francisco, Cal., has been incorporated with $150,000 capital. W. F. Chandler, W. A. Jacobs, W. S. Porter, O. Schribner and F. H. Buck are the incorporators.

The City Foundry Co. of Cleveland, O., has increased its capital from $75,000 to $100,000.

The Butler Check Co. of Greenfield, Mass., has been incorporated in Maine with $10,000 capital to manufacture machinists' tools. F. J. Hosmer and J. H. Sanderson are the incorporators.

John C. Dwyer, formerly superintendent of the Birmingham Rolling Mills, Birmingham, Ala., is organizing a new company with $500,000 capitalization for the purpose of operating a rolling mill in the Birmingham district.

The Loew Supply & Manufacturing Co. of Cranford, N. J., has been incorporated with $75,000 capital to manufacture tools. S. J. Cox, Herman Meyer and S. S. Newton are the incorporators.

The Standard Specialty Tube Co. has been incorporated at Paterson, N. J., to manufacture a collapsible tube. Capital, $30,000. D. H. Kortendyke, J. B. Vreeland and R. E. Horton are the incorporators.

The Lacey Buck Iron Co., Chattanooga, Tenn., has applied for a charter of incorporation, giving its capital stock at $300,000. Mr. Lacey, the president, is of Chicago. The company will develop mineral tracts in North Alabama and Tennessee.

The capital stock of the Hutchinson Machine & Foundry Co., at Hutchinson, Kan., has been increased $10,000.

The Fleetwood Foundry Machine Co. has been organized with a capital stock of $50,000. The company will operate the plant formerly occupied by Schaeffer, Merkel & Co., at Fleetwood, Pa.

New Construction:—

Mayer Bros., Mankato, Minn., has had plans prepared for a fireproof machine shop, 200x60 feet, two stories high, which will be erected at a cost of $10,000.

The Southern Rolling Mill Co., which was recently incorporated by Ben W. Catchings and others, of Birmingham, Ala., has selected a site for the establishment of its plant at a point between Ensley and Pratt City, Ala. The company will build

a 10-inch guide mill, backed by a roughing mill and a continuous heating furnace heated by gas. Arrangements have been made for the installation of 600-horsepower upright boilers and an engine, 34x60, capable of giving 900 horsepower; 42-ton flywheel will be used; there will be no puddling department in connection, as steel billets will be rerolled. For full particulars, address R. W. Catchings & Co., 68 Wall street, New York, and 1914 Morris Building, Birmingham, Ala.

The Buckeye Malleable Iron & Coupler Co.'s new plant, which is being built at Columbus, O., is rapidly nearing completion. The main foundry building is 800x135 feet, the auxiliary building 500x100 feet, and the pattern shop 250x50.

The Columbia Foundry & Machine Co., St. Joseph, Mo., will build a foundry, 60x200, to cost $5,000.

The Fred M. Prescott Steam Pump Works, Milwaukee, Wis., will build an addition to its plant this spring, according to sports.

The Sargent Co., manufacturer of draw bars, knuckles and coupler parts, located at 59th and Wallace streets, Chicago, are having plans drawn and specifications prepared for an extension to give them approximately three times the capacity of the present plant.

Whitehead & Kales, Detroit, Mich., engineers and contractors, have purchased three acres of land on which they will erect a steel frame building, two stories high, 100x200 feet, to cost $15,000.

The Milwaukee Gas Light Co., Milwaukee, Wis., is letting contracts for the erection of a machine shop in the Menominee Valley. The Riter-Conley Manufacturing Co., Pittsburg, Pa., have been awarded the contract for the steel work on the retort house, power building and condensing plant.

The Cane Belt Railway System will erect machine shops at Lane, Tex.

It is reported the Pittsburg Reduction Co., Pittsburg, Pa., has purchased a site in East St. Louis, Ill., upon which it will erect a plant for the manufacture of aluminum wire.

The Penberthy Injector Co., Detroit, Mich., will erect a factory building on Greenwood avenue this spring.

The American Bridge Co. is erecting a building, 45x65 feet, to be used as a repair shop, at Manchester, Va.

The Nashville, Chattanooga & St. Louis Railroad Co. will build machine shops at Martin, Ala.

The H. N. Strait Mfg. Co., Kansas City, Kans., is increasing the capacity of its plant by additions to the machine shop and foundry, each 210x100. A new engine and boiler room has just been completed in which were installed three 100-horsepower boilers and a 250-horsepower engine.

At a recent meeting of the directors of the Rolling Mill Co. of America, Connellsville, Pa., it was decided to erect an open-hearth plant with a capacity of 140 tons daily. The plant will consist of two 35-ton furnaces. A bar mill and a breaking down mill will also be erected. The work of laying the foundations for the mills and engines has already been commenced. As previously noted in these columns the sheet plant, which will be provided with steel by this open-hearth plant, will contain ten hot mills and six cold mills. C. F. Poppleton, formerly connected with S. V. Huber & Co., consulting engineers, Pittsburg, is the consulting engineer of the company and has the entire work of erection in charge.

T. C. Roberts and G. D. Berry, of St. Joseph, Mo., will build a foundry and architectural iron plant in Kansas City, Mo., to cost $250,000.

It is reported that the William Skinner & Sons Shipbuilding & Dry Dock Co., Baltimore, Md., is to build extensive marine machine shops, and that it will increase its capital from $300,000 to $400,000 to provide funds for this purpose.

The recently incorporated Sharon Foundry Co., Sharon, Pa., has decided to erect its plant at Wheatland, Pa. The foundry will supply castings for the Sharon Steel Co. and its allied interests.

The Jeffrey Manufacturing Co., Columbus, O., will erect a two-story machine shop adjoining its present plant. It will be 350 feet long and 110 feet wide.

The galvanizing department of the plant of the American Steel & Wire Co., DeKalb, Ill., is to be greatly enlarged by the erection of an addition to the building.

A branch of the Lamb Wire Fence Co., of Adrian, Mich., is to be located at Davenport, Ia. The company that will erect the plant will operate under the corporate name of the Western Fence Co. The plant is to be in operation by September.

The Kelley & Tanneyhill Drilling Co., Waterloo, Ia., will erect a new foundry, 40x70 feet.

The Chicago Pneumatic Tool Co., Chicago, Ill., will erect an addition to its Boyer plant at Detroit, Mich. The new building will be 41x48 feet.

The Central Iron & Steel Co., Harrisburg, Pa., will shortly ask for bids for the erection of four 50-ton open-hearth furnaces. The plant will be located between the Paxton furnace and the 126-inch rolling mill. The Harrisburg Pipe & Pipe Bending Co. is also considering the erection of an open-hearth steel plant and definite action will be taken shortly.

The recently incorporated Sullivan Nut Lock Co., of Hartford, Conn., is considering the advisability of erecting a plant at Willimantic, Conn.

The board of trade of Niles, O., last week closed a deal with Wade A. Taylor and associates whereby Niles secures the new sheet mill to be erected by this new company. The mill will be located on the Geo. C. Campbell farm on the south branch of the Mahoning river. It will consist of four hot mills, two stands of cold rolls, a sheet bar mill, roofing plant and later a galvanizing plant will be built. Work on the erection of the plant will be commenced at once, and it is probable that the plant can be placed in operation no later than September. Associated with Mr. Taylor are C. J. Thomas, former superintendent of the Struthers mill, and J. L. O'Dea, manager of the roofing department of the Youngstown Iron & Steel Roofing Co.

The Rutland railroad has placed orders for $20,000 worth of new machinery to equip the machine shop at Rutland, Vt. The new plant will cost some $225,000 and employ over 200 men.

A chain factory is to be located at Maxwell, Ind. W. S. Woodall and James A. Wells, of Zanesville, O., are principal stockholders.

Plans for the new 40-inch blooming mill at the Bessemer plant of the Republic Iron & Steel Co., at Youngstown, O., have been completed. The improvement will cost $50,000. The present converting mill is to be enlarged to twice its capacity by the installation of 10-ton converters.

The Elevator Co. of Moline, Ill., will erect a machine shop about 55 feet square and three stories. This will more than double the machine shop capacity.

The Big Four Railroad Co. contemplates the erection of machine shops and other improvements to its property at Springfield, O. A modern plant employing 500 men and the expenditure of $500,000 is proposed.

W. D. Williams, proprietor of the Williams Foundry & Machine Works at Fredericksburg, Va., will rebuild the plant which was recently destroyed by fire. The new building will be much larger than the old one.

The Carroll foundry at Bucyrus, O., is to be enlarged by the addition of two large buildings. A heavy punching and shearing machine, weighing 18 tons, is to be added.

A building permit in the sum of $10,000 has been issued to the Mahoning Foundry & Machine Co., Youngstown, O. The buildings are now under construction.

The Ohio Stove Foundry, Portsmouth, O., expects to build an addition to the molding room. It will be 60x100 feet and will give room for twenty additional molders.

Louis Haberman of Brooklyn is planning to establish a tinware plant in Middletown, Conn. Mr. Haberman was formerly superintendent of the Eastern Tinware Co. of Portland, Conn.

The Lewistown Foundry & Machine Co., Lewistown, Pa., will build an office and warehouse and install new equipment.

Deere & Co. of Moline, Ill., will build a power plant and have thorough electrical equipment.

The Wireton Heating Co. of Blue Island will locate at Chicago Heights, Ill. The company has secured a five-acre site and in rebuilding will largely increase the proportions of the former plant, which was burned four weeks ago. Contracts have been let for the erection of a large number of buildings. These will include: Foundry, 80x150 feet; machine and tin shop, 50x250, two stories high; pattern shop, 50x80, two stories high; boiler and engine house, 50x80, and warehouse, 100x200. The company expects to begin operations by July 1, and will give employment to about 250 workmen. The officers of the company are: M. Austin, president; E. A. Bil-

lings, vice-president; A. C. Cattrell, treasurer, and E. H. Heald, secretary and manager.

The Keystone Foundry Co. of Pottstown, Pa., has been incorporated by Nathan Hoffman, John Davis, John H. Henricks, A. K. Shaner, S. J. Schwenk, Newton Kline, J. H. Morris, W. M. Bunting, all residents of Pottstown. The treasurer is Mr. Bunting. Capital stock, $25,000.

The work of reconstructing the rolling mills at the Tudor works, East St. Louis, owned by the Republic Iron & Steel Co., is now well under way. The work is in charge of J. H. Ross, the new superintendent, lately of Franklin, O., and H. Olden, lately of Chicago.

The Northrup foundry at Washington, Pa., is to be enlarged. An addition, 25x48 feet, is to be built and another cupola erected.

O. B. Greeves will build a $28,000 boiler shop at Beaumont, Tex.

The American Radiator Co. of Chicago is to build a large warehouse at Nashua, N. H. The building will be 125x300 feet. The company may increase its manufacturing facilities at Nashua.

The Foundry Co. of Toronto, Can., has purchased a site at Toronto Junction and will expend some $40,000 in buildings. The company manufactures stoves.

Fires and Accidents:—

The W. D. Williams Foundry & Machine Works, Fredericksburg, Va., was recently destroyed by fire, entailing a loss of $20,000.

The tin plate stamping plant of Sidney Shepard & Co., Chicago, Ill., was damaged by fire last week to the extent of $100,000.

The machine shop of A. Mendelhall & Son at Oscaloosa, Ia., was destroyed by fire March 11. Loss $2,000.

The Pittsburg District:—

The Westinghouse Machine Co. awarded contracts last week for the erection of its new foundry, to be erected at Trafford City, on the main line of the Pennsylvania railroad, formerly known as Stewart Station. The foundry building will be 612 feet long and 184 feet wide, and will contain three cupolas with an annual capacity of 100,000,000 pounds of castings. The Machine Co. now uses 50,000,000 pounds of castings annually, and will require about 75,000,000 pounds when the new plant is ready for operation. Adjoining the foundry will be a three-story pattern shop 603 feet long and 80 feet wide. An office building will also be erected near by. The two buildings will be placed on a 22-acre site and the floor space will cover about 5 acres. The steel required in the erection of the buildings will amount to nearly 4,000 tons, and the Cambria Steel Co. will furnish the same. The contract for the erection of the buildings has been awarded to James Stewart & Co. The new foundry will concentrate the four foundries now operated by the company now located in Pittsburg, Allegheny, Cleveland and East Pittsburg.

The Pittsburg Filter Manufacturing Co., of Pittsburg, Pa., has been awarded the contract for the installation of a central gravity treating plant for the Ensley, Ala., plant of the Tennessee Coal, Iron & Railroad Co. The plant will have a capacity of 2,500,000 gallons daily, and will be the largest filer plant ever erected in this country in connection with a steel plant. The plant is to be completed by June 1.

Owing to the scarcity of structural material a portion of the plant of the McClintic-Marshall Construction Co., Braddock, Pa., was shut down this week.

The Iron City Engineering Co., of Pittsburg, has been awarded the contract for the installation of a complete electric lighting plant in the new school building to be erected at Prunytown, W. Va. The plant will consist of an 85-h. p. direct connected engine; 50-k. w. generator and switchboard; 100-h. p. boiler and 200-h. p. feed water heater.

The John Eichleay, Jr., Structural Co., of Pittsburg, has been incorporated with $1,000 capital under the laws of the state of Pennsylvania. The capitalization is merely nominal.

The American Bridge Co. has been awarded the contract for all the viaducts that are to be erected between the Monongahela and Ohio rivers by the Wabash railroad, calling for about 15,000 tons of material. This contract, together with others recently awarded the American Bridge Co. by the Wabash Railroad brings the total tonnage of structural material required up to about 30,000 tons. The bridges and viaducts are all to be completed within a year. The structural material will all be rolled at the Carnegie plants and at the mills of Jones & Laughlins, Ltd.

The new general offices of the Riter-Conley Manufacturing Co., Water street, Pittsburg, were thrown open for the first time on Saturday, March 15. The building is large and commodious providing ample room for the office force and very light rooms for the draughting department. It was announced that the new plant of the company at Leetsdale, Pa., would be completed by September.

General Industrial Notes:—

The Commonwealth Steel Co., St. Louis, Mo., has placed an order with the Crocker-Wheeler Co. for a 500-kilowatt generator. The Allis-Chalmers Co., Chicago, has also placed an order with this company for a 300-kilowatt generator for the power house of its new plant at Allis, Wis.

It is probable that the Cleveland works, at Cleveland, of the Republic Iron & Steel Co., will be dismantled the coming spring; also at the same time the Marion and Westerman works at Marion, Ind., the Wetherald works at Frankton, Ind., and the New Albany works at New Albany, Ind.

Winterhalter & Sons, Sebewaing, Mich., expect to have their new foundry and machine shop completed by the middle of this month. The main building will be 40x60 feet, with a wing 24x60 feet.

The C. H. Hopke foundry, of Rockford, Ill., is running full force. The new foundry is 125x80 feet, with additional machine shop 100x40 feet, and a cupola house 60x30 feet.

A press dispatch from Cincinnati announces the application for a receiver for the Belmer-Eames Tool Co., of that city. The application is made by Mr. Belmer, and a temporary injunction was granted. The matter will have further hearing.

The Hartford Blower Co., of Hartford, Conn., has received an order from the Pratt & Whitney Co., of the same city, for a complete system for removing the shavings, sawdust, chips, dust, etc., from the machinery in the woodworking department. This system consists of the exhauster, dust collector, piping and hoods, together with all special fittings, etc. The refuse is removed from each machine, and conveyed to a dust collector placed on the roof, from which it is deposited into a dust receptacle, and thence to a pipe leading to the first floor, where it can be loaded on to a wagon and taken away.

Fred Spencer has disposed of his interest in the Spencer boiler works at Sioux City, Ia., and the business will be conducted by J. A. Spencer.

The plant of the Keystone Drop Forge Co., Philadelphia, Pa., is to be removed to Chester, Pa., where a site for the plant has already been purchased. The new plant will be larger and more modern in every respect than the present plant.

The McCormick Harvesting Machine Co., Chicago, has leased twenty acres of land along the drainage canal for fifty years, and has agreed to widen the channel and build docks.

The Stirling Co. has just shipped 41 car-loads of boilers from its plant at Barberton, O., to Porto Rico, to be installed in sugar works.

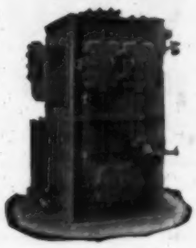
A meeting of the stockholders of the LaBelle Iron Works, Steubenville, O., will be held at Wheeling, W. Va., on March 25 for the purpose of increasing the capital stock from $3,000,000 to $5,000,000. There is little doubt that the resolution will be adopted. The company is making extensive improvements at Steubenville while the new construction includes skelp mills, pipe mills and an open-hearth plant.

The Red Jacket furnace of the National Steel Co., at New Castle, Pa., is out of blast undergoing repairs. A large gang of workmen is engaged in doing the work, as the stack is to be put into blast as soon as the alterations and additions to the steel plant are completed.

The Bethlehem Steel Co., South Bethlehem, Pa., is now engaged in the rolling of shapes to a large extent. A conversion contract recently closed with the Carnegie Steel Co. calls for 12,000 tons of material, while the American Bridge Co recently placed an order for 35,000 tons of angles from 3 to 6 inches. One of the rail mills which has been idle for several years will be utilized, while it is probable that an additional blast furnace will be started.

EVER SHOVEL COAL?

Perhaps you're the man who pays the bills.



Men shovel coal and clean boilers just as reluctantly as other men pay big bills for coal—for cleaning boilers—for repairs to boilers—for new boilers.

As manufacturers of Feed-Water Heaters, we take this occasion to remind you of what can be done in the way of **saving money** and **labor** by using the right kind of a Feed-Water Heater—a "COCHRANE," for example.

If the temperature of the water now being pumped into your boilers is less than 200° F.—say 180° or under—and there is any exhaust steam puffing out of your exhaust stack, then you are wasting money—and somebody has to shovel coal that need never have been bought. With the COCHRANE HEATER you would get 200° before any exhaust steam escaped, and from that up, depending upon your surplus exhaust. If your feed-water supply is not perfectly free from scale-forming matter and yours is a closed or pressure heater, without a good OIL SEPARATOR in front of it, and a tank for holding the condensation, or a receiver pump for returning it direct to the boilers, then you're missing a glorious opportunity for keeping scale out of your boilers—and scale sticks to iron tighter than a burr to a dog's ear.

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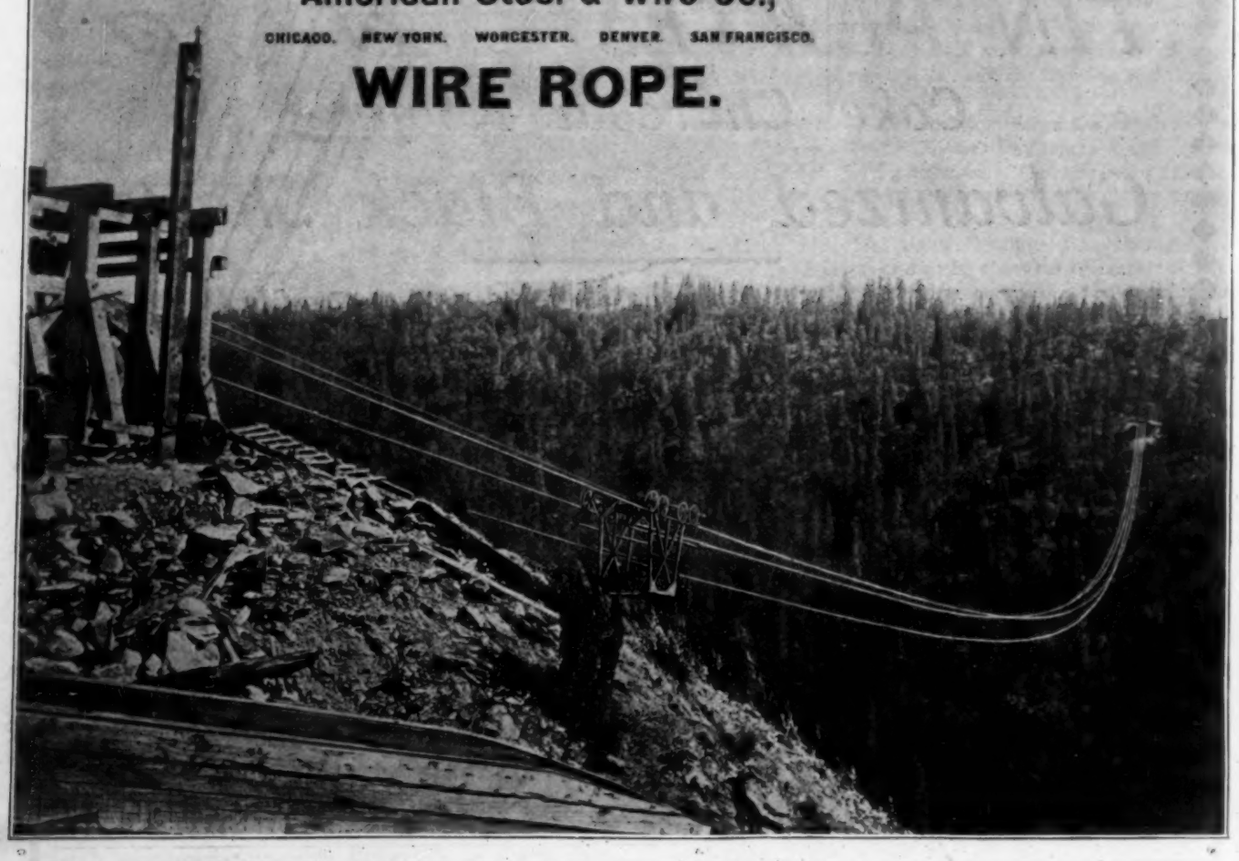

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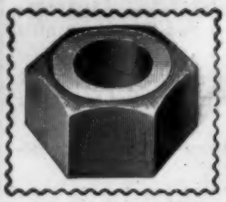

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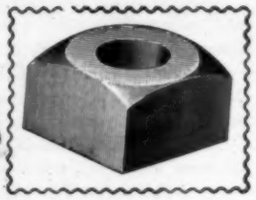

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